RAILROAD GAZETTE

FRIDAY, JULY 12, 1901.

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Contributions

The Gold-Sewell Coupler Patents.

Gold Car Heating Company,
New York, July 2, 1901.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Your issue of the 14th of June, 1901, contains a brief article entitled "The Gold Straight Port Coupler Decision in Canada," setting forth the fact that the Court of King's Bench on Appeal, composed of five most eminent judges, had unanimously decided in favor of the Gold Car Heating Company as against the Consolidated Car Heating Company, and holding that the Gold Straight Port Coupler is not an infringement of the Sewell Canadian patent. There is, however, one statement in your article which was not and is not correct. That statement is the last paragraph of the article wherein you say that the Consolidated Car Heating Company has appealed from the above decision to the Privy Council. As a matter of fact, at the time that your article was printed no such appeal had been taken, but since then a motion was made by the Consolidated Car Heating Company for *leave* to appeal to the Privy Council, and this motion was denied; thereafter the Consolidated Car Heating Company renewed their motion for leave to appeal before the Court of King's Bench, and in this they were again defeated. So that the Consolidated Car Heating Company has not up to this time appealed to the Privy Council nor has it been granted any leave by any Court to take any such appeal to the Privy Council, nor has the Consolidated Car Heating Company taken any appeal whatever from the above unanimous decision of the Court of King's Bench. In justice to ourselves we trust that you will publish this letter in full.

GOLD CAR HEATING COMPANY,
EDWARD E. GOLD, *President.*

The Brake Shoe Tests.

Saratoga Springs, N. Y., June 24, 1901.

TO THE EDITOR OF THE RAILROAD GAZETTE.

The very interesting report of the Committee on Laboratory Tests of Brake Shoes at the present convention of the Master Car Builders' Association has excited unusual interest and comment, and in view of the great importance of the subject, I desire to present some fact and theories resulting from my study of the records, which are not brought out in the report.

Prof. R. A. Smart, of Purdue University, simply made the prescribed tests on the shoes presented and turned over the data obtained without further comment or conclusions to the committee, who prepared the report and framed the specifications. Concerning the work done on the M. C. B. testing machine at Purdue University, I have had occasion to check their records by trials with shoes previously tested on the same machine in the shops of the Westinghouse Air Brake Co., at Wilmerding, Pa., and the exact duplication of results has convinced me, that the work done for the committee at Purdue University can be safely compared with that noted in the 1896 report.

As to the report of the committee it is to be regretted that it does not state: First: The origin of the shoes tested; that is, whether they were taken from the stock purchased by a railroad company for general use or whether the shoes were first contributed to the railroad company for test and by the railroad sent to Mr. Bush for test. Second, a description of each shoe tested as revealed by a careful examination of its structure and particularly of the character of its bearing face as tested. These facts will doubtless be brought out in the discussion of the report and appear in due time in the records. However, for the purpose of a proper understanding of the charts herewith, it is necessary to give a description of the competing shoes as determined by a careful inspection of the longitudinal sections of the shoes tested, which show clearly the relative hardness and character of the bearing faces.

Description of Sections.

Shoe 47.—"Lappin," length 14¼ in., made by the Lappin Brake Shoe Co., under what is known as the "Hatt" patent, which consists in chilling a cast-iron shoe on each side at each end and partly around the ends. The chilled portion stops about ½ in. above the face of the new shoe, so that ½ in. must be worn away before the hard metal comes in contact with the wheel. About ⅛ in. of metal has been taken from the shoe in question and there was simply a continuous surface of unchilled cast-iron against the wheel in all the tests. The section of shoe No. 47 along the bearing face shows a dense light gray iron free from chill, the only variation to be a small skin of chilled metal ⅛ in. thick and ½ in. above the shoe face.

Shoe 48, "U," The Sargent Co.—This shoe broke in consequence of a shrink crack in the chilled end. See description of similar shoe No. 55.

Shoe No. 49, "Streeter," The Lappin Brake Shoe Co.—Length, 14½ in. Body of fine gray cast-iron with a curved insert of white iron 12¾ in. long in the bearing face. There was no chill in the main body of the shoe, but the insert was quite hard, showing a white fracture and a polished bearing face much cracked by heat. This insert was apparently slightly softened or annealed when the main body of the shoe was cast about it; this fact is indicated by the drill entering the insert ¼ of an inch.

Shoe No. 50, "Corning," Corning Brake Shoe Co.—Length 13.8 in. Body of shoe light gray iron, fine texture chilled to a depth of 1 in. at each end and 2¼ in. on the bearing face at each end, making a total extent of chilled bearing surface of 37 per cent. of the whole face. Between the chilled faces is an insert of soft cast-iron 6¾ in. long and ⅜ in. thick. The chilled end shows a high polish, while the soft part of the face shows the usual scoring of soft iron. The drill would not enter the chilled end.

Shoe No. 51, "Herron," Ross-Meehan Foundry Co.—Length, 14½ in. A body of strong gray iron with 5 inserts ⅝ in. thick and ¼ in. wide, disposed along the bearing face. These inserts are of hard white iron similar to the Streeter insert and like that appear to have been annealed and softened when the body of the shoe was cast about them. The drill entered the insert about ¼ in. There was no chill in the body of the shoe.

Shoe No. 52, "Cardwell," Drexel Railway Supply Co.—Length 13¾ in. Body of soft cast iron having an insert 12½ in. long and ⅝ in. thick; this insert is perforated and forms with the metal in the body of the shoe, which surrounds it and fills the holes, a composite wearing face of two kinds of cast-iron. Both body and insert show no sign of mottled or chilled iron and are readily pierced by the drill.

Shoe No. 53, "Ideal," Spears & Miller.—Length, 14 in. Body of fine light gray cast-iron chilled at each end 1¾ in. high, extending on the bearing face ⅞ in. and ¾ in. respectively at each end, with a chilled section 1¼ in. wide at the middle of the face. The area of chill being about 20 per cent. of the whole face. There are two pockets 4 in. x 2 in. between the chilled faces, filled with a compound supposed to consist of asphalt and iron turnings.

Shoe No. 54, "Cardwell," Drexel Railway Supply Co.—Length, 13⅜ in. Body of soft cast-iron insert 12½ in. long of similar metal to body, the only difference apparently, over 52, is in the body, which is softer.

Shoe 55, "U," The Sargent Co.—Length, 14¾ in. Body of strong cast-iron (steel mixture) with ¾ in. chill on each end. Chilled face is about 10 per cent. of the total bearing surface. Face shows polished end and the usual scored conditions of the softer surface.

Shoe No. 56, "Composite," Composite Brake Shoe Co.—Length, 13⅞ in. Body of soft cast-iron, dark open structure, 8 inserts of cork 1 in. diam., face of corks about ⅜ in. below face of cast-iron. Some of the corks do not reach the bottom of the holes and appear shriveled and charred. Face of shoe shows the usual scoring incident to unchilled cast-iron.

Shoes No. 58 and 59, Diamond "S," Sargent Co., and Ramapo Foundry Co.—Two shoes tested show results practically agreeing so that the average figures are taken in the charts presented. Fractures were not presented for inspection. From the record it is safe to say that the body of the shoe was a fine grain light gray iron with the usual insert bundle of expanded sheet steel and the shoe face would show the plain cast iron traversed in diagonal lines by the strands of soft steel.

Action of Shoes Under Test.

Having a fair idea of the material in the shoes let us consider their action to determine the location of each class of brake shoes, now in the market, in the scale of efficiency as regards their work in controlling the moving wheel. To stop a revolving wheel means the performance of a certain amount of work which may be executed in three ways:

First. In wearing the shoe.
Second. In wearing the tire.
Third. In generating heat.

If the work is done and the wheel not worn, the shoe is worn. If the work is done and the shoe not worn, the wheel is worn, and if neither the shoe nor wheel wears the work is not done. Something must go in this transformation of motion into work and heat, and while it is claimed by some that brake shoes have been made that show high friction with little sacrifice of the parts in contact, I have yet to see the claims proved and do not believe it is a possibility commercially. The report of the committee deals with brake shoes for car and coach wheels and conclusions from the records should not be too freely drawn for driving wheel service, in which the question of tire wear plays a strong part, but in the discussion of these records, especially in the frictional effect on steel tired wheels, certain results will be seen to occur which can only be explained on the theory that the shoe is wearing the tire.

Charts 1 and 2 show the comparative retarding power on chilled wheel, at minimum and maximum load, and 40 and 65 miles per hour, the ordinates being the mean coefficient of friction and the abcissas being the speed in miles per hour. Notice the uniformity of the records on the chilled wheel. See how the shoes group themselves in the order of hardness with the softer and best holding shoes at the top and the harder and weaker acting shoes at the bottom. Throughout all the tests this order occurs, the rapid wearing shoes showing the maximum retarding power and the more durable shoe the minimum retardation which accounts for their long life. The records on the chilled wheel are, I think, the best indication of the relative values of the shoes, because there is no action of the shoe on the wheel to cause the curve to change its position, because of friction generated by tire cutting. With the chilled wheel the shoe stands on its own merits as a friction generator.

There are, however, certain changes in the position of

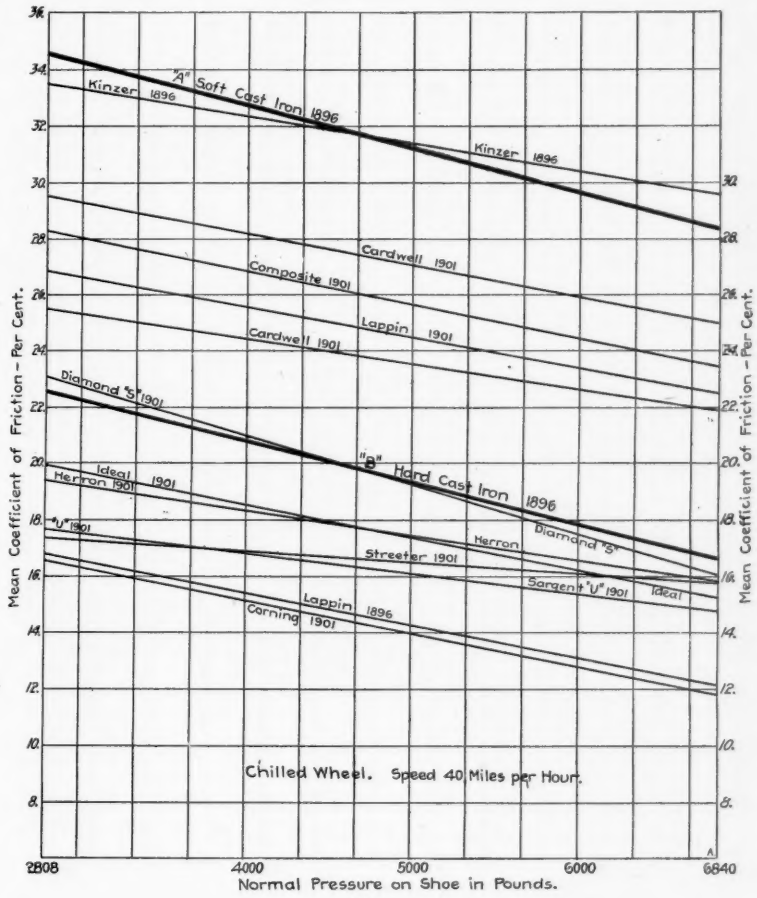


Diagram A.

the curves of certain shoes which can only be explained by a variation in hardness in the shoe face by reason of an increase in temperature due to increase of load or speed.

In charts 1 and 2 the Cardwell, Lappin and Composite shoes occupy the upper positions between the very soft and hard iron shoes of the 1896 test. They are of comparatively soft cast-iron as indicated by their fractures, as well as by their location on the chart. (It should not be forgotten that the Lappin shoe in question is that of the test and not the Lappin shoe known in railroad service.)

Next in order comes the Diamond "S" shoe, of unchilled cast-iron, designed to meet an average condition between the extremes of the 1896 test. The insert in this shoe is there to give toughness rather than hardness and to offer by the strands of mild steel appearing in the wearing face, interruption to the continued grinding away of the cast-iron and thus prolong the shoe life with as little sacrifice of friction as possible.

The Herron and Streeter shoes are types of Composite shoes which have a soft cast-iron body and an annealed insert. The Congdon shoe of the 1896 test belongs to this class. The inserts of the Herron and Streeter shoes are very hard, but not so hard as an integral chill and their position in the friction scale is the measure of their durability, being much more durable than the shoes above them, but falling below the strictly chilled shoes in life.

The Ideal shoe is really a chilled shoe, the composition filling has high frictional properties as long as it retains its expansive power; the bond, however, is a mineral resin, so to speak, which volatilizes as the temperature rises, and in time the filling disintegrates and falls out or ceases to expand to hold the hard chilled face from the wheel and then the friction falls. The record shows to what extent the filling operates.

The "U" shoe belongs in the chilled class and rightly takes its place in the lower scale. The ends of this shoe are tapered and extend beyond the length of the ordinary shoe 1¼ in., and all the chilled metal is confined to the tapered ends beyond the limits of the brake head. The shoe tested was not worn to a true bearing over all the chilled surfaces so that only about 10 per cent. of the shoe face was hard, which accounts partly for the higher position in the scale. Another reason may account for the higher friction of the "U" shoe and that is the fact that the tapered ends, though chilled, get very hot and apparently soften, and therefore hold more and doubtless wear more than were the ends thicker to withstand the heat.

The Corning shoe is almost identical with the real Lappin shoe. That is a cast-iron shoe with heavily chilled areas at each end. Extreme durability is the chief characteristic of this sort of shoe and the reason is clearly given in the charts. I have never known the Corning or Lappin shoes to injure a wheel either chilled or steel tire. If the shoe is not worn and the wheel is not worn the work is not done. The record speaks for itself.

In so far as the friction on chilled wheel is concerned, the report indicates practically three classes of brake shoes represented in the test.

First. Soft shoes without hard inserts or chills.

Second. Composite shoes, soft iron and hard inserts.

Third. Hard shoes, with integral chilled surfaces.

Chart No. 5 is inserted in order to show more clearly the separation of the shoes tested into the three divisions named.

Charts 3 and 4 show the comparative retarding powers on steel tired wheel, maximum and minimum loads; speed 40 and 60 miles per hour. These illustrate the action of the various shoes on steel-tired wheels and the element of tire dressing enters into the question, to account for the change in position of some of the shoes in comparison with their record on the chilled wheel.

The Streeter and Herron shoes have risen in the scale above their location in the chilled wheel test, while the other shoes have descended. The wear of these shoes is increased slightly, but not enough to account for the increase in work done and the only explanation I can give, is that these shoes are wearing the tire.

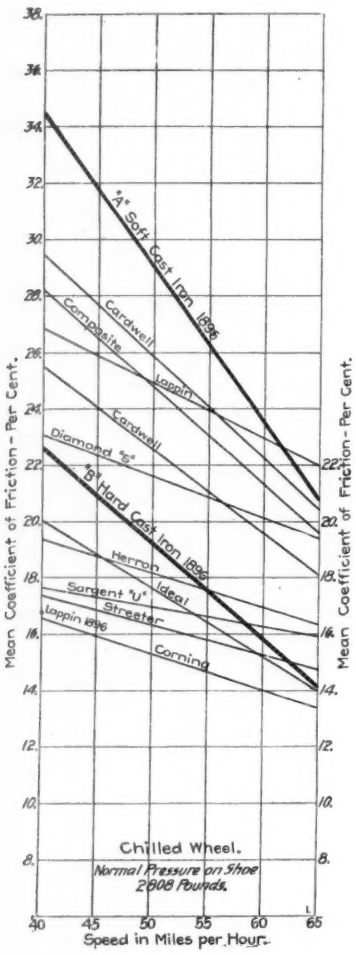


Diagram 1.

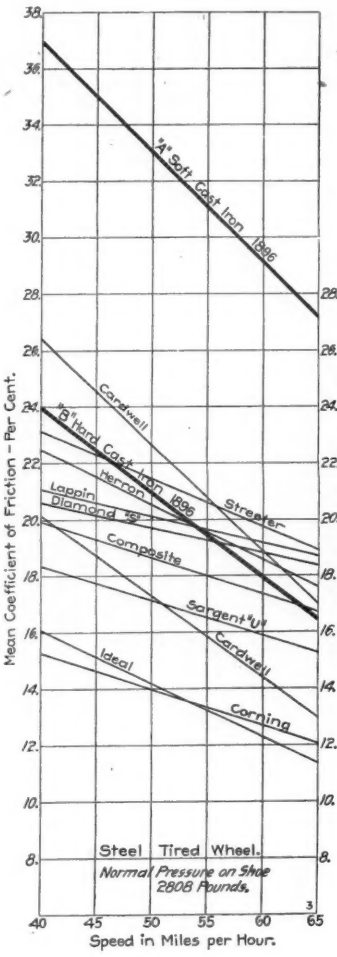


Diagram 3.

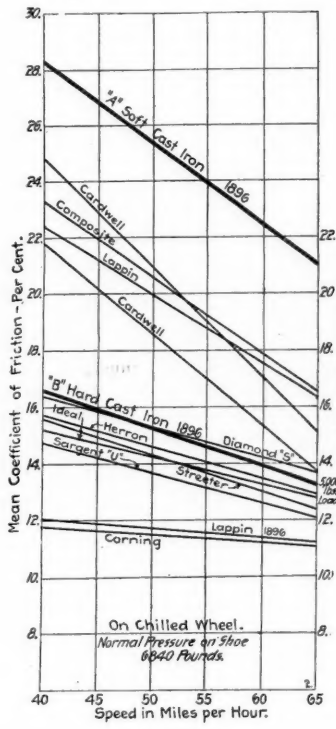


Diagram 2.

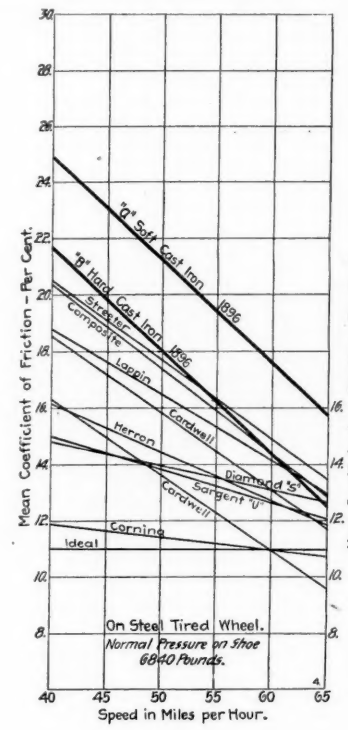


Diagram 4.

Note that the chilled shoes, the "U" and "Corning," show the same position on the steel tire as on the chilled wheel, which would indicate that they have no effect on the tire.

The Diamond S follows the action of the unchilled cast-iron shoes and takes a lower position on the steel tire than it occupied on the chilled wheel under similar conditions. This indicates no wear on the tire. The Ideal falls heavily which would seem to prove that the composition filling acts as a lubricant and lowers the friction when used against the steel tire.

The action of one of the Cardwell shoes is singular and it is hard to account for its peculiar curve; standing high up in the scale on chilled wheel it falls to the lowest round of the ladder on the steel tire at high speed. This shoe also shows the greatest rate of wear and some cause of its different action from the other soft cast-iron shoes may be found in the fact that the particles ground from this shoe are of a particularly fine and sooty nature resembling somewhat graphite, leaving a dark black streak when rubbed. Whereas the particles from the other shoes are flakes and more or less clean and free from the sooty dust. It has been suggested that this shoe may have had much graphite carbon in its combination which was liberated by its grinding on the wheel. It shows quite a marked contrast with the other Cardwell shoe, which, we understand, was one of the same lot supplied a railroad, for test.

The question of wear of the various shoes under test as shown in the report is somewhat hard to understand. Based on their friction records the wear of some of the shoes seems out of all proportion to the work done; especially is this the case in connection with the so-called Lappin shoe, which shows less wear than other shoes while showing a great deal less friction. If this shoe in its fracture indicated a tough ductile structure like mild steel or wrought iron or copper, there would be a ready cause for the low record of wear, but the shoe is simply plain cast-iron; a low chilling mixture at that, and it is simply impossible for such a shoe to prove more durable than the "U" or the Diamond S in service on the road. I think the probable explanation is as follows: The rate of wear from abrasion of a granular surface, such as soft cast-iron, varies more with the difference in the area of the surface, in contact than it does with changes in the pressure per unit of surface and the Lappin shoe having 20 per cent. less surface to abrade, actually wore less, although there was a corresponding increase in load per unit of surface, because there was less surface to grind.

The question of specification for brake shoes is one which the M. C. B. Association must decide, and whatever they agree upon will have to be met by the manufacturer. In view of the fact that the majority of the plain cast-iron shoes in use throughout the country are below rather than above the "B" shoe of the 1896 record, it would seem advisable to locate the limit below the "B" record and this we understand has been done, and it is up to the railroad gentlemen themselves to live up to their profession. It was suggested to the committee that the line be drawn so as to exclude the chilled shoes, which all come at the bottom of the scale; the reason for this is that such a shoe can be instantly detected by breaking. Whereas, the value of other shoes can only be determined by tests on a special machine requiring much time and labor. The M. C. B. Association is to be congratulated on the action taken and they have now gone on record against brake shoes which certainly lower the efficiency of the brake mechanism. Two ways were open to them, one to maintain the present standard of brake pressure and wear out shoes, and the other to increase their brake pressure, use hard shoes and wear out wheels. They have taken the wise course and the manufacturers will undoubtedly do their part and furnish shoes to meet specifications.

F. W. SARGENT,
Managing Engineer American Brake Shoe Co.

Cleaning and Sanitation of Cars and Stations.

The French Minister of Public Works, M. Pierre Baudin, has just addressed to the managers of the French railroads a circular letter calling attention to recent modifications in the law and to sanitary precautions that should be at once taken. We give a very free translation, much abridged.

It has been demonstrated by many striking examples that diseases may be avoided by preventive means, but the railroad companies do not appear to have understood the importance of what is being done and may yet be done in this direction. It is of the highest interest that they pay more attention to this side of their duties. To stimulate their action in this direction the decree of March 1, 1901, was issued modifying the law of Dec. 15, 1846.

Under this decree it is forbidden absolutely to sweep and dust car compartments while dry. The floors must be sprinkled and the seats and woodwork must be wiped with cloths moistened with some antiseptic solution. Dry sweeping and dusting only serve to scatter disease germs and particularly the bacillus of tuberculosis.

Arrangements must be made for the complete periodical disinfection of cars and for the daily cleaning of the compartments. In order to carry out this purpose the floors should be waterproofed or covered with carpets of India rubber, linoleum or something of the kind. The sides should be in wood, lincrusta or pegamoid. The cushions should be upholstered with some material not having a long pile and preferably with a non-permeable material.

Similarly in waiting rooms and around other station buildings, dry sweeping is forbidden, and those places

that may be carpeted should be covered with something that can be washed. Courts and other places that permit it should be arranged for daily washing down with copious supply of water and quick drainage should be provided.

Finally, placards should be conspicuously displayed everywhere forbidding people to spit on the floors.

The linen of sleeping cars must be properly washed and subjected to high temperature in the process of cleaning, after each journey, and to it should be attached a ticket indicating to the passenger the date of the last cleaning.

Managing officers should make known to the Minister what they are doing to carry out these orders, but meantime, they must take the following measures:

Remove all carpets other than linoleum, India rubber or like substances.

Forbid, absolutely, dry sweeping and dusting in cars, waiting rooms, baggage rooms, halls, etc.

While waiting for opportunity to replace all upholstered coverings with material that may be washed, the backs and seats should be protected by movable coverings which can be washed and subjected to high temperature.

Finally, it is forbidden to carry persons visibly or notoriously affected by contagious diseases in compartments that are used by the public. This last matter is one that naturally will require pretty delicate treatment on the part of the managing officers.

American Society of Civil Engineers.

We give below a short report of the thirty-third annual convention of the American Society of Civil Engineers lately held at Niagara Falls:

The first session was on June 25. At 10 a. m. President Croes called the meeting to order, and called upon George A. Ricker, M. Am. Soc. C. E., Chairman of the Committee of the Engineers' Society of Western New York, for the reception of visiting engineers. Mr. Ricker welcomed the Society to Niagara, and outlined in a general way the present condition of the most important work in which engineers are interested in the vicinity of Buffalo and Niagara Falls.

The address of the President, entitled "A Century of Civil Engineering," was then delivered.

Major Thomas W. Symons invited any of those interested to visit the Government work under his charge in the harbor of Buffalo on any of the days of the convention. and Mr. Walter McCulloh, on behalf of the local committee, described briefly the engineering work of interest at Niagara Falls, and said the committee was prepared to afford facilities to any member desiring to see these works.

The business meeting then convened, and the Secretary presented the report of the Board of Direction on the proposition that a Special Committee on Standard Rail Sections be appointed.

SPECIAL COMMITTEE ON STANDARD RAIL SECTIONS.

Arguments in favor:

1—The American Society of Civil Engineers has already recognized this subject as a proper one for consideration and report by a special committee.

2—The special committee, thus authorized, became convinced that experience in the use of steel rails had reached a stage at which standard patterns were not only feasible but desirable, and, accordingly, in August, 1893, recommended a series of rail sections for given weights per yard.

3—The result of the report of the special committee may be indicated by these two facts: *First*, that in February, 1881, the rail mills in this country had 188 different patterns which were considered standard, and that 119 patterns of 27 different weights per yard were regularly manufactured; *Second*, that in 1899, or six years after the publication of the report of the special committee, fully 75 per cent. of all the rails rolled in the United States were of the pattern recommended in that report.

4—It would seem, therefore, that a suggestion that these sections are in any respect unsatisfactory should not be disregarded, for if the sections now recognized as standard are to be modified in any respect, such modification should have an indorsement of significance equal to that given to the original sections.

5—To investigate and report upon engineering matters which are of general interest to the profession, is a distinctly proper function of this Society. It is submitted that a report from a Special Committee on Rail Sections should summarize the present state of the art of rail-making, and cover an investigation of all questions relating thereto whether of section, composition of the material, or processes of manufacture, and that such a report, whether it recommended a change in any of the sections heretofore established or not, would be of great value.

Arguments against:

1—The rail sections recommended by the special committee of the Society in 1893 have been very generally adopted, and are now recognized as standard.

2—Well established standards should not be questioned without good reasons, and no special committee should be appointed to reconsider the present standard sections unless upon evidence that a change of section is necessary or advisable.

3—No such evidence has been placed before the Society or the Board of Direction.

4—In any case it does not appear that a special committee, if appointed, should be limited by its instructions to the consideration of proposed changes in section alone, as questions of composition and manufacture may be quite as influential in any failure of the present standard sections to meet requirements which may be demonstrated.

After careful consideration the Board of Direction, believing that the reasons in favor of the appointment of the proposed committee outweigh those against such appointment, makes the following recommendation:

That a special committee be appointed, as provided in the Constitution of the Society, for the following purposes:

1—To report upon the results obtained in the use of rails of the sections presented to the Society in annual convention, Aug. 2, 1893, by a special committee appointed for that purpose.

2—To report whether any modification of any of said sections is advisable, and if so to recommend such modification.

3—To report upon the recognized practice as to chemical composition and mechanical treatment used in the manufacture of rails, and the manner of inspection of the same.

4—To report upon the advisability of the establishment of a form of specification covering the manufacture and inspection of rails.

5—If found advisable, to recommend a form of specification for the manufacture and inspection of rails.

The recommendation of the Board of Direction was adopted and a ballot ordered.

The proposed amendment to the constitution, the purport of which is to place the election of all members in the hands of the Board of Direction, was presented by the Secretary, and after considerable discussion, in which it was pointed out that there were matters connected with the election of members not brought out in the present proposed amendment, and probably needing revision, it was decided that a committee of seven be appointed by the President, one representative from each of the seven geographical districts into which the Society is divided, to report to the annual meeting of the Society in January, 1902.

The Secretary presented the result of the vote on the time and place for holding the annual convention of 1902, which showed that out of 275 votes Washington, D. C., received 86, 66 other places receiving a scattering vote.

The Secretary announced the appointment by the Board of Direction of the following committee to recommend the award of prizes for the year ending with the month of June, 1901: Messrs. Charles McMillan, O. H. Ernst and Edward Flad.

On the evening of June 25 Walter McCulloh, M. Am. Soc. C. E., entertained the Society with an address, illustrated with stereopticon views, on the bridges of Niagara.

On Wednesday, June 26, was held a meeting for topical discussion. The first topic was "Do the interests of the profession and the duty of its members to the public require that only those who are competent be allowed to practice as civil engineers? Under what authority, through what agency and upon what evidence of competency should applicants be admitted to the practice of civil engineering?"

The Secretary presented a paper prepared by Samuel Whinery, Director Am. Soc. C. E., and the subject was further discussed by Messrs. Foster Crowell, Frank C. Osborn, H. W. Brinckerhoff, Frank A. Hinds, Wm. R. Hutton, John F. Wallace, Desmond Fitz Gerald, Clemens Herschel, Emil Kuichling, Edward A. Bond and P. A. Maignen. It was finally resolved that the matter be referred to a committee of five to be appointed by the Chair, and to report to the next annual convention.

The second topic of discussion was then taken up as follows: "Steel Concrete Construction: What stress in tension and compression should be allowed in concrete? What is the proper modulus of elasticity of concrete? In steel concrete arches:

"(1) What should be the ratio of steel section to concrete section, and what is the best form and disposition of the former?

"(2) What consideration should be given to temperature changes and consequent stresses?

"(3) What are the best proportions for concrete, and what is the best method of placing it?"

The discussion was opened by R. S. Buck, M. Am. Soc. C. E., who followed his opening discussion by reading a paper by Leon S. Moisseiff, Assoc. M. Am. Soc. C. E., and the subject was further discussed by Messrs. J. R. Worcester, H. S. Jacoby, Leonard C. Wason, A. L. Johnson, William Parker.

The discussion of the third topic was then taken up. "The decolorization of water: When is it necessary? How may it be accomplished?"

This discussion was opened by G. C. Whipple, Assoc. M. Am. Soc. C. E., and the subject was further discussed by Messrs. Allen Hazen, George A. Soper, George W. Fuller, P. A. Maignen, J. N. Chester, Frederic P. Stearns, Frank A. Hinds, Clemens Herschel, Desmond FitzGerald and H. F. Dunham.

A motion introduced by Mr. J. N. Chester that a committee be appointed by the President to report to a future business meeting on the advisability of adopting a standard for turbidity and color in water was after some discussion lost.

The meeting then adjourned to meet at 10 o'clock on Thursday, June 27, for the discussion of the fourth topic.

At 2:30 p. m. a special train, furnished without cost by the New York Central & Hudson River R. R., took the convention to the Pan-American Exposition, where at 4:30 p. m., the Society was officially received by John G. Milburn, President, and William I. Buchanan, Director General of the Pan-American Exposition, in the Mines and Metallurgy Building, which, through the kindness of Dr. David T. Day, Superintendent, was reserved exclusively for the use of the members of the Society and their guests.

The last meeting of the convention was held on Thursday at 10 a. m. The fourth topic for discussion was "The consumption of water in municipal supplies and the restriction of waste."

This discussion was opened by Emil Kuichling, M. Am. Soc. C. E., and was continued by Messrs. Clemens Herschell, Dexter Brackett, Gardner S. Williams, Edward Flad, C. W. Hubbell, J. N. Chester, John C. Trautwine, Jr., Rudolph Hering, Desmond FitzGerald, D. C. Humphreys, P. A. Maignen, Oberlin Smith, J. H. Harlowe, H. F. Dunham and J. J. R. Croes.

Engineering Education—Buffalo Meeting.

The ninth annual meeting of the Society for the Promotion of Engineering Education was held at Buffalo June 29, July 1 and 2. The question raised a year ago as to the possible future usefulness of the Society along lines previously followed is held to have answered itself. The value of the 25 papers presented and the worth of the discussions to engineers, both in college and out, is considered to amply justify the conclusion that its resources have not been exhausted or its usefulness expended.

After the transaction of general business on Saturday morning, the retiring President, Professor Frank O. Marvin, Dean of the School of Engineering, University of Kansas, read his address entitled, "The Cultural Value of Engineering Education." Professor Marvin does not attempt a definition of culture, but rather mentions seven fundamental qualities which relate to it, especially with reference to the young engineer. Summarized these are as follows (1) The man of culture must be a thinking and reflecting being. (2) He must be able to form right judgments, which implies that his standards must be based on sound principles of right and wrong. (3) There is no true culture for the man who does not work. (4) He must be of even balance; must see things in their right relations and due proportions. This requires maturity of thought. (5) Besides being able to form correct judgments, he must be able to skilfully present them in well chosen and fitting English. This requires that he should have a taste for the best that has been written in his mother tongue. (6) An appreciation for beauty. (7) Agreeable manners. The writer points out that the training demanded of the engineer should in all cases tend to fill these requirements of a cultured man. Professor Marvin believes that an engineering training will be more and more recognized as the one best fitted to lead to positions of an executive nature in connection with industrial enterprises and in the administration of public works.

Two tendencies are mentioned as opposed to the desirable results suggested in his paper: First, crowding too much foundation work back upon the preparatory school, already overloaded; second, allowing technical subjects to crowd the fundamental general ones from the college course, in the vain attempt to make an engineer by college study. In a word, the President's address was a strong plea for a more thorough preparation in the young man's college course, if he would be classed with cultured men.

In the first paper taken up, Professor O. H. Landreth, of Union College, opened an important discussion on the principles of administration in engineering schools, showing in what particular they failed in showing the relation between the theory learned and its practical, every-day application to industrial problems. This opened the consideration of the neglected training for executive positions of the graduates. The weight of the argument as based on experience as in railroad and shop work, was that executive ability could be stimulated by courses in contracts and business transactions, and by lectures from men connected with large commercial interests. Professor Allen stated that an important element in executive ability was a good understanding of what was wanted and what to expect, and this comes from experience. On the railroads are found the best conditions for development along this line, where the man begins at the bottom and works up. The railroads are drawing their men more and more from the technical schools. Professor Allen did not believe education weakens executive ability.

The last paper at the morning session was by Professor J. P. Jackson, of the Pennsylvania State College, on "The Arrangement of Undergraduate Courses in Electrical Engineering." This paper, with the discussion, was strongly favorable to a direct application of theory to commercially practical problems and to a close relation between mechanical and electrical courses. The first two years of a course should be given to a theoretical study, bringing out principles, and the last two years to problems of commercial value. An opportunity is

being lost in not fitting for the conditions in those lines where technical men are in demand.

At the afternoon session, the first paper was by Professor C. F. Burgess, of the University of Wisconsin, in which he recommended the appointment of a committee to compile a suitable list of books on various branches of engineering and applied science, for guidance to librarians in obtaining books for public and school libraries. The committee was subsequently appointed, to act with a similar committee of the National Educational Association. Such a list is greatly needed in order to encourage library committees to give more favorable consideration to the selection of works on engineering.

This paper was followed by a description illustrated by lantern slides of Houston Hall, University of Pennsylvania. Professor H. W. Spangler described the building, spoke of its stimulating effect on producing a healthy social environment and described the details of management which is practically under the student body. The next paper, by Professor C. L. Crandall, of Cornell, on "Modern Languages in Engineering Courses," evoked an extended discussion of their value as a culture study. Professor J. B. Johnson stated that the boys are now being crowded to the very limit, and better results might be obtained by substituting for the languages some of the more humanistic studies, as commercial geography and banking interests. Mr. Kent believed that these studies could be read by any one at almost any time, but languages could be mastered only by hard study. The general opinion was strongly in favor of French and German as requirements for graduation. It was suggested, however, that these could be studied before entrance, as was done in one of the Western universities.

The following are the newly-elected officers of the Society:

President, Robert Fletcher, Director of Thayer School, Dartmouth College, Hanover, N. H.

Vice-Presidents, Storm Bull, University of Wisconsin; C. M. Woodward, Washington University.

Secretary, H. S. Jacoby, Cornell University.

Treasurer, C. A. Waldo, Purdue University.

Members of Council: Until 1903, C. F. Allen, Massachusetts Institute; until 1904, W. F. M. Goss, Purdue; T. Gray, Rose Polytechnic; D. C. Humphreys, Washington and Lee University; O. H. Landreth, Union; W. G. Raymond, Rensselaer; L. E. Reber, Pennsylvania State; L. S. Randolph, Virginia Polytechnic Institute.

Electric Interlocking Near Sixteenth Street, Chicago.*

One of the largest interlocking plants ever installed in the United States has recently been completed by the Taylor Signal Co. of Buffalo at the crossings of the St. Charles Air Line and the Chicago, Madison & Northern with the Chicago, Rock Island & Pacific and Lake Shore & Michigan Southern near Sixteenth and Clark streets, Chicago, the arrangement of tracks, switches and signals being as shown on the accompanying diagram. It will be noted that eight bridges, spanning from two to six tracks, are used to support the high signals; also that a drawbridge is bolt-locked and signaled. The apparatus is the Taylor "all-electric."

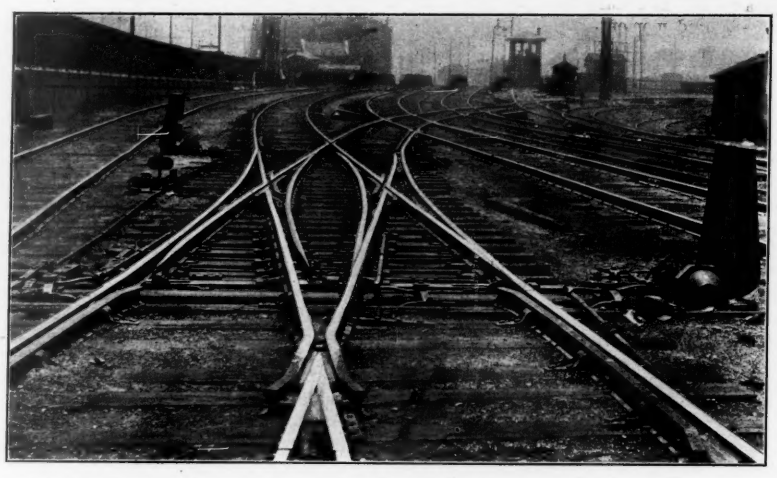
There are approximately 150 regular train movements daily on the Chicago, Madison & Northern and St. Charles Air Line tracks and 700 on the Chicago, Rock Island & Pacific and Lake Shore & Michigan Southern tracks, in addition to which there is a very heavy switching movement; and as both the Chicago, Rock Island & Pacific and Lake Shore & Michigan Southern run many suburban trains, the movements over the crossing in the early morning and evening hours is especially heavy. A mechanical plant would require 160 working levers for the proper movement of signals, switches, derails and locks, and the machine would be 75 ft. long if one spare space is allowed to each eight working levers. It would require at least three men constantly for its operation and probably four in the early morning and evening hours. The Taylor machine employed is 26 ft. long, and requires one man for its operation, except during the early morning and evening hours, when a "split-trick" man is used. Thus, in this Taylor plant, four eight-hour men handle the machine more easily than ten eight-hour men could handle a mechanical plant.

A feature distinguishing the Taylor from all other interlocking systems is that the sole power employed for effecting and controlling the switch and signal movements is electricity, and at this, as well as other large plants installed by the Taylor Signal Company, the signal lamps are lighted by electricity. The electric current is derived from storage batteries, there being two sets of 55 cells each and of 150 ampere-hour capacity, these batteries being charged by a direct connected 2½-k.w. generator, driven by a 5-h.p. gasoline engine. Duplicate generators and engines are furnished to enable repairs to be made to machinery and batteries without affecting the operation of the plant, each engine and generator being capable of furnishing all the current required to charge the batteries and to light all the signal lamps. The switchboard is so arranged that these lamps can be connected to either one of the two batteries or to either one of the generators, and also provides for connecting either of the batteries to either of the generators for charging or for connecting them to the interlocking machine, for the control and operation of switch and signal motors.

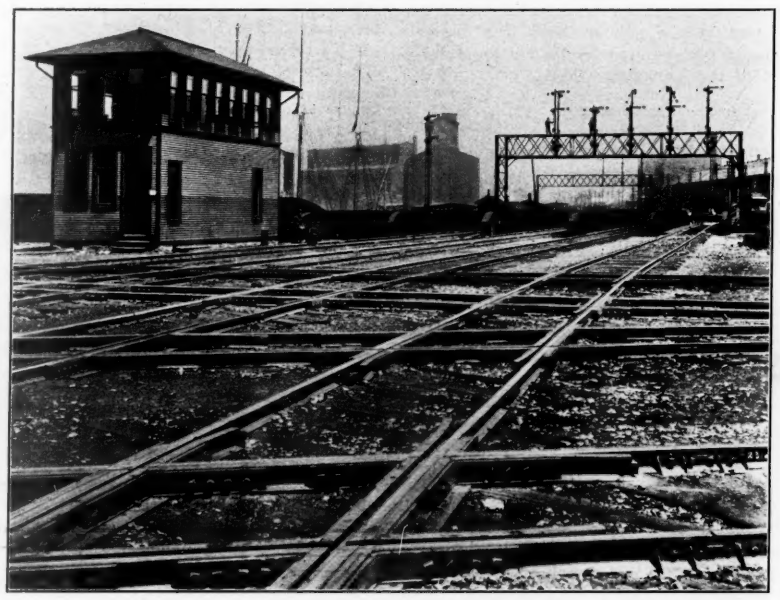
The levers are interlocked mechanically by cross-locking very similar to that used in the manual interlocking machines, the first part of a movement of a lever in either direction locking all other switch and signal levers, the movement of which would set up a route conflicting with the new position of the switch or signal controlled by this lever. The intermediate part of the movement effects the change of the circuit controller, which is attached mechanically to the lever, from the "normal" to the "reverse" position or vice versa. The final part of the movement releases other switch and signal levers whose movements help in setting up the route, and would conflict with the original position of this particular switch or signal. The lever is stopped at the end of the intermediate part of its movement in either direction by a latch. This latch is forced into place to lock the lever by a cam on the lever itself so that the lever is certain to be stopped by the latch as anything that could prevent the latch going into place would stop the lever by means of the cam. The latch is disengaged at the proper time by an electro-magnet energized by a current developed by the switch motor acting as a generator after it has performed its work of moving and locking the switch, or by the signal motor when the signal is put back to normal.

The construction of the switch-operating machine is such that the preliminary part of the movement withdraws the bolt from the lock rod. This same part of the movement lifts the detector bar, which is the same as the bar used with manual switches. The intermediate part of the movement effects the transfer of the switch points from one position to the other, and the final part of the movement replaces the bolt in position to lock the switch and lowers the detector bar into place.

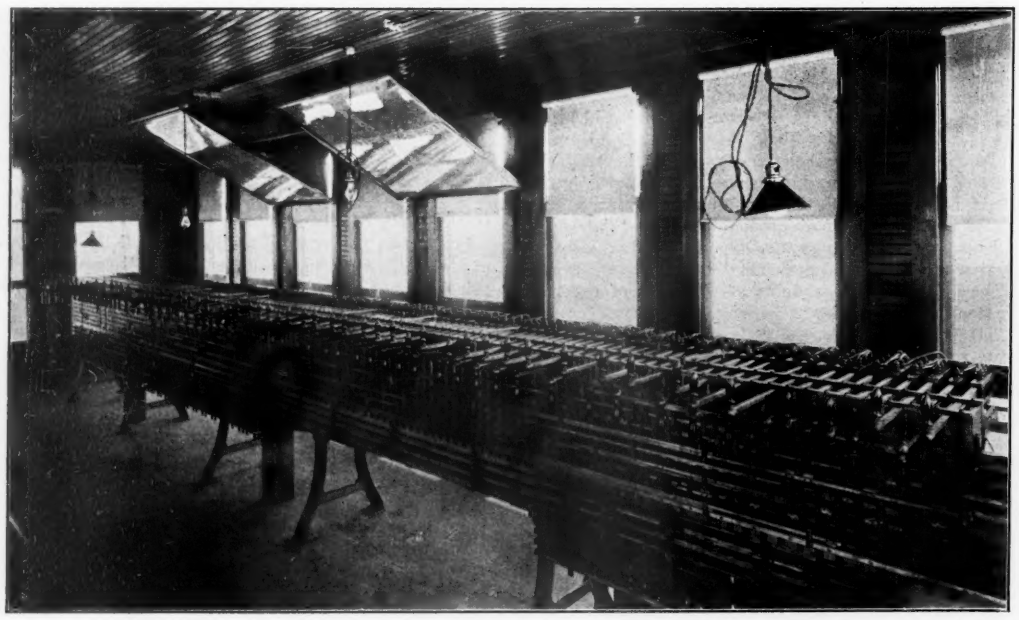
A mechanical clutch operates to disengage the motor from the rest of the mechanism at the time when the lock bolt is fully home. This prevents any shock to the



Slip Switches Worked by Taylor Electric Motors—Sixteenth Street, Chicago.
Looking South from "A." Motors Uncovered.



Electrically Operated Semaphore Signals—Sixteenth Street, Chicago.
Looking North.



Taylor Electric Interlocking Machine at Sixteenth and Clark Streets, Chicago.
C., R. I. & P.; L. S. & M. S.; C., M. & N.; St. Charles Air Line.

*For a more detailed description of the Taylor apparatus see the *Railroad Gazette* Sept. 28, 1900.

machine, and leaves the armature free to rotate under the influence of acquired momentum. The final part of the movement of the lock bolt actuates a circuit controller, whose movement disconnects the motor from the source of power and establishes another circuit including only the motor and the indication magnet on the interlocking machine. The rotation of the armature due to momentum, develops a very strong current which energizes the indication magnet and thus disengages the latch from its connection with the cam on the lever, releasing the lever and permitting it to be moved into its final position. This method of indication and releasing the locking is another of the distinctive and valuable features of this system. It will be seen that, as the indication current is derived from the switch motor itself, and as this cannot be developed until the circuit controller at the switch is reversed, and as this reversal is effected only by the final movement of the lock bolt, the getting of this indication and release is assurance that the switch is home and locked. The current generated by the switch motor not only serves for indication purposes, but also serves to stop the rotation of the switch motor quickly and without shock after it has performed its proper functions.

The signals indicate in only one direction—that is, when going to the "normal" or "stop" position. An indication in the "reverse" position is generally unnecessary as usually no other movement depends on the signal clearing. But, when the clearing of one signal is dependent upon the clearing of another, as, for example, when a distant signal is to be cleared after a home signal, this is provided for by taking the distant signal circuit through a circuit closer operated by the home signal, and so connected that the home signal must be cleared before a circuit can be established to the distant signal. The current for operating the signal indicating and releasing mechanism when the signal lever is put back to "normal" is derived from the signal motor acting as a generator. It is driven by the counterweight, and the circuit is established for this current only when the arm has nearly reached the horizontal position. This current, besides its use for indication purposes, serves to stop the fall of the counterweight without shock.

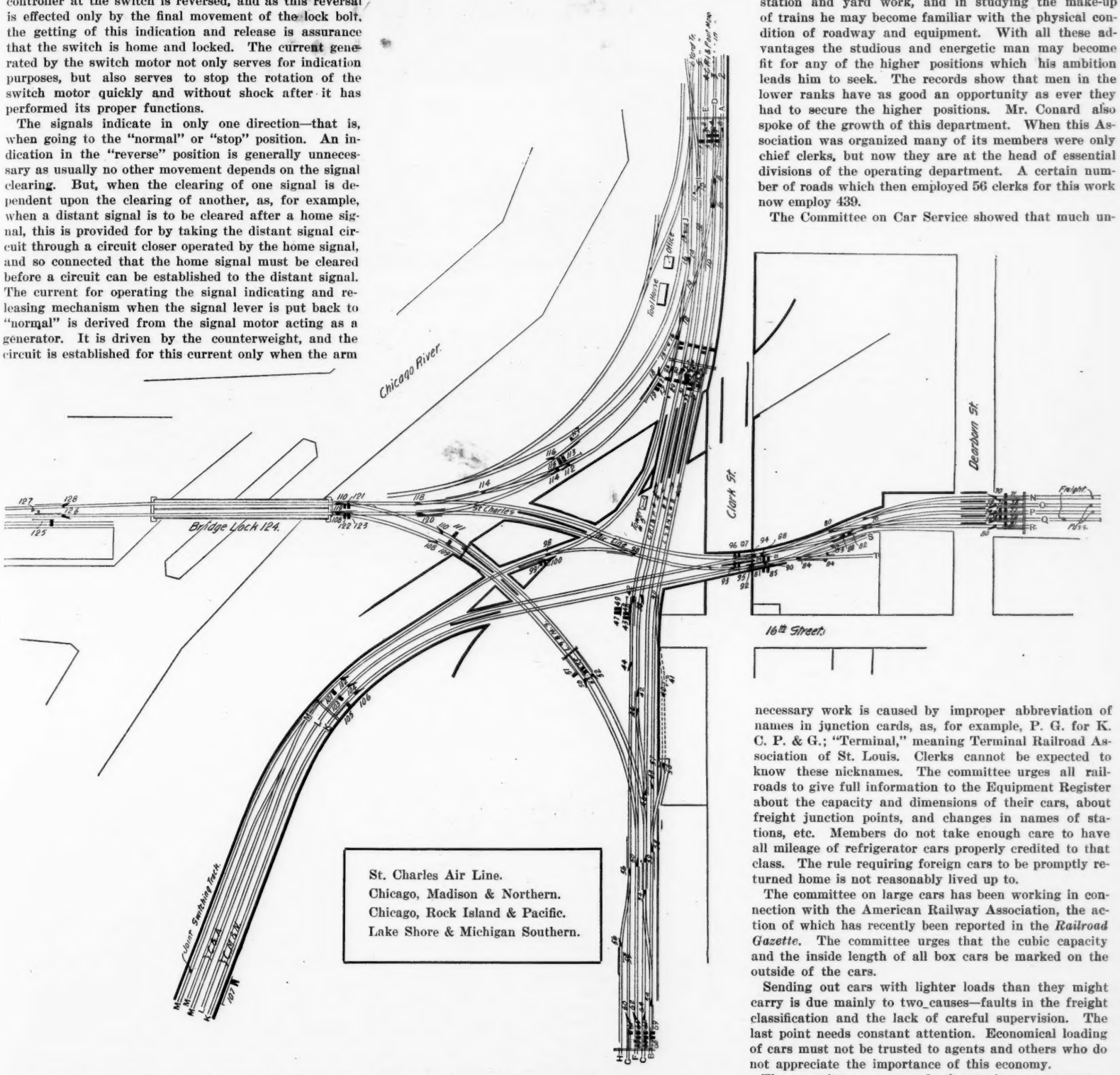
The conducting wires of the Taylor system are enclosed in wooden trunking. The trunking is supported every 8 ft. on stakes a little above ground. It has been found by experience in electric block signaling extending over a number of years that this construction is reliable, and that the conductors are durable, and especially more durable than small galvanized pipes placed under ground.

In considering the cost of electric operation some figures may be interesting. It is found that the maximum current required to make a switch movement is seven amperes and the maximum time three seconds, or 21 ampere-seconds. It requires a maximum of four amperes for one second to reverse or clear a signal, or four ampere-seconds. It requires one-eighth ampere to hold a signal at "clear," and, assuming the signal to be held clear two minutes on an average, this will amount to 15 ampere-seconds, or a total for each signal movement of 19 ampere-seconds. Assuming a thousand train movements at this place daily and an average of four switch and two signal movements per train, it would require 33.88 ampere-hours of current per day.

At this rate, one set of batteries would last on one charge about four and one-half days. With the ordinary usage the batteries will have, their efficiency is about 75 per cent., and the efficiency of the generator 80 per cent. It will require, then, about 8½-h.p. hours to store up this 33.88 ampere-hours of current at a total cost for fuel of nine cents; or at a cost of one cent for 444 switch and 222 signal movements. One set of batteries can be charged in eight hours at the normal rate from one generator so that the engines need be run only eight hours in four and a half days.

Owing to the fact that the engines are used but little, and under favorable conditions, they require little attention, and are run and looked after by the leverman or signal repairman.

Because electrical energy is used in the operation of the plant, it is possible to light the signals with electricity without additional apparatus, thus saving the expense of the care and lighting of the lamps. On account of the nature of the power employed, the switches and signals at a great distance are handled, and the indications are returned as quickly as from those near the tower. Of course, larger wires have to be used to the distant functions, but it is thoroughly practicable to get these results at a reasonable cost, while with any other form of power transmission it is not practicable.



Switches and Signals at Sixteenth and Clark Streets, Chicago—Apparatus Made and Installed by the Taylor Signal Co., Buffalo, N. Y.

Car Accountants' Convention.

The 26th annual convention of the International Association of Car Accountants was held at Detroit June 19 and 20. Papers were read by Messrs. G. P. Conard and W. H. Rosevear, and reports were made by the committees on car service, on large cars and on light loading of cars. Mr. Rosevear's paper consisted of reminiscences, which were much enjoyed by his hearers. Mr. Conard enlarged upon the usefulness of the car accountant and his excellent opportunities. The man in charge of car service gets a comprehensive view of the whole of the operations of his railroad. He is compelled to become thoroughly posted in geography, and he learns all about the flow of different kinds of traffic; he may learn the local conditions all over his own road, get experience in station and yard work, and in studying the make-up of trains he may become familiar with the physical condition of roadway and equipment. With all these advantages the studious and energetic man may become fit for any of the higher positions which his ambition leads him to seek. The records show that men in the lower ranks have as good an opportunity as ever they had to secure the higher positions. Mr. Conard also spoke of the growth of this department. When this Association was organized many of its members were only chief clerks, but now they are at the head of essential divisions of the operating department. A certain number of roads which then employed 56 clerks for this work now employ 439.

The Committee on Car Service showed that much unnecessary work is caused by improper abbreviation of names in junction cards, as, for example, P. G. for K. C. P. & G.; "Terminal," meaning Terminal Railroad Association of St. Louis. Clerks cannot be expected to know these nicknames. The committee urges all railroads to give full information to the Equipment Register about the capacity and dimensions of their cars, about freight junction points, and changes in names of stations, etc. Members do not take enough care to have all mileage of refrigerator cars properly credited to that class. The rule requiring foreign cars to be promptly returned home is not reasonably lived up to.

The committee on large cars has been working in connection with the American Railway Association, the action of which has recently been reported in the *Railroad Gazette*. The committee urges that the cubic capacity and the inside length of all box cars be marked on the outside of the cars.

Sending out cars with lighter loads than they might carry is due mainly to two causes—faults in the freight classification and the lack of careful supervision. The last point needs constant attention. Economical loading of cars must not be trusted to agents and others who do not appreciate the importance of this economy.

The committee recommends that train reports sent to car record officers should show the weight of the lading in the cars.

The President of the Association for the ensuing year is Mr. O. W. Stager (P. & R.), Philadelphia; Secretary, L. G. Corcoran (P. R. R.), Buffalo, N. Y.

Foreign Railroad Notes.

The French slope of the Pyrenees is cut up by long, narrow valleys, some of which have extraordinarily attractive scenery and are much frequented by tourists. In one of these two electric mountain railroads have been recently opened, both having their connection with the steam railroad at Pierrefitte, near Lourdes, and extending thence one to Cauteretz and the other to Luz, where there are famous hot springs.

The gates at level crossings in Belgium have been

largely manned by women, the husband being held responsible for her being on hand at the prescribed hours; he is usually a section hand or other employee resident at or near the gate. The management has decided that this does not work well, and will substitute men for the women.

The flush times in Germany seem to have culminated last year; having begun there earlier than here. Reports for all railroads of the Empire in March show a decrease of 1¾ per cent. in gross earnings. Freight earnings decreased 3⅞ per cent., but passenger earnings increased 4¾ per cent., which latter shows that the great mass of the people are still prosperous.

Distributing Coal Cars on the Norfolk & Western.

A recent decision of Judge J. J. Jackson, in the United States District Court for West Virginia, gives an interesting account of the way in which the Norfolk & Western apportions cars to the various shippers of coal in the Pocahontas district, and incidentally shows some of the difficulties in carrying out exact justice as between rival shippers at times when the supply of cars is insufficient to accommodate all of the business which is offered. The decision is in a suit brought by the Indian Ridge Coal & Coke Company, asking the court to compel the road to furnish the cars desired for two large shipments going to Lambert's Point. The court decided, not only that the road was in good faith carrying out its regulation for supplying cars to all shippers impartially, but also that the regulation itself was the best that could be made.

The complaint was filed January 15, and was to compel the road to supply cars to carry coal to two vessels due to arrive at the port January 15 and January 17. It was alleged that certain other shippers had all the cars they wanted, while the I. R. C. & C. Co. had not enough to correspond with the capacity of its mine; 300 cars a week were being delivered to these other shippers. Moreover, certain shippers had an arbitrary allowance of cars besides their proportion of the general stock of cars.

The railroad company in its defense showed that the vessels did not arrive exactly as expected; that enough cars were delivered so that some coal was shipped, and that the delay to the vessels was not serious. It was affirmed that cars had been distributed without fear, favor or discrimination. The 300 cars delivered to other shippers were for fuel for the railroad company. The I. R. Co. had refused to sell to the railroad as cheaply as these other shippers sold to it.

The delivery of more cars to certain shippers than to others was in accordance with an arrangement made at the opening of the road. When the line was built to the mines on the east side of Great Flat Top Mountain the company had 1,500 cars for the business; on extending the line through a tunnel to the west side of the mountain, at great cost, it was found that transportation to the seaboard from the new mines would cost five or ten cents more a ton; and, after discussion, a group rate, the same from all of the mines, was made; and in order not to deprive the east side shippers of their natural advantage it was agreed that all of the 1,500 cars in use up to that time should be allotted to these east side mines.

To market the Pocahontas coal it is necessary to sift out the slack and make it into coke, and the land owners require each coal operator to establish one hundred ovens for every five hundred acres of coal land leased; in connection with this the railroad agreed to furnish 1½ coal cars for each oven, and to distribute the cars to each shipper according to the number of his ovens. The Indian River Company and all other shippers agreed to these plans. The railroad has furnished nearly two cars per oven.

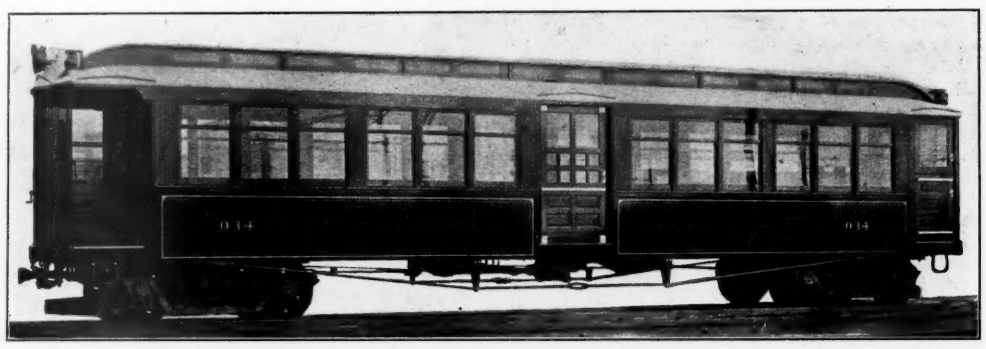
The court finds that the discrimination above described was not unjust; it also finds that other shippers had more capacity than cars. The Indian River Company had offered to provide some cars itself, but this offer included a contract by which the railroad was to buy the cars, paying for them on installments, and the court finds that it would have been unlawful for the road to accept such cars and use them exclusively for one shipper. If accepted the railroad would be part owner of them at once and would have to use them in general traffic. On this point Judge Jackson quotes Chairman Cooley in the case of Rice vs. L. & N. (I. C. C., Feb. 15, 1888) as follows: "It is properly the business of railroad companies to supply to their customers suitable vehicles of transportation; and then to offer their use to everybody impartially. If the varieties of traffic are such, and their requirements of rolling stock so numerous and diversified that this becomes impracticable or burdensome, so that the aid of their customers becomes essential or convenient, the supply obtained by their assistance cannot with any justice be utilized by the carrier in such manner as to establish discriminations which would otherwise be inadmissible. *The carrier has no right to hire rolling stock and then allow it to be used exclusively by one class of persons on such terms as will drive out of business those who are compelled to use its own rolling stock in a competitive traffic.*"

Continuing, Judge Jackson says that the plan of car distribution is not only reasonable but unique. It is exceptionally fair and advantageous to all concerned. It trains the railroad employees to be methodical. It is good for the shippers because publicity is one of its main features. The shipper knows how many cars there are; both the cars and the ovens are in plain view of everybody, and each shipper can figure out for himself whether or not he is getting his share. The excellence of the plan is proved by experience, as a large volume of business has been done, and the present complaint is the first one that has been heard. The mandamus was refused.

The Cars of the Boston Elevated Railroad.

In our issue of June 28 we gave a general article on the Boston Elevated Railroad, and among the important features briefly mentioned are the cars. We now give an illustration from a photograph received from the St. Louis Car Company showing one of 45 double-truck vestibule motor coaches which that company furnished to the road.

The car body is 38 ft. 4½ in. long and the platforms



Standard Car of the Boston Elevated.
Built by the ST. LOUIS CAR COMPANY.

are each 4 ft. long, making the total length 46 ft. 4½ in., the width being 8 ft. 7 in. The underframing is composite, the side sills being of 3 in. x 8 in. Southern pine with 6 in. channels on the inside, and the center sills of 5 in. steel I-beams. The end sills are likewise composed of wood and steel, and the body bolsters are of wrought steel built up with malleable iron castings. The needle beams are 5 in. steel I-beams trussed, and the entire floor is thoroughly braced with cross timbers, making a very rigid lower structure.

There is a motorman's cab on each platform at diagonally opposite corners, and a door in each side of this cab. These doors are so arranged that the upper half can be swung inward and folded against the body of the car, or the entire door can be swung inward and folded. When the doors are thus opened gates take their place. The switches for motors, heaters and lights are placed under the roof of the motorman's cab in a compartment lined with ⅜ in. asbestos. The side of the platform opposite the motorman's cab has folding gates, and the portion of the end of the platform which is open has a rail and safety chains.

For convenient reference we repeat from the description of June 28 the following essential points of the truck and motor equipment. There is a motor truck and a trailing truck for each car. The wheel base of the motor truck is 6 ft. and that of the trailing truck 5 ft. The motor truck has 33 in. wheels, and the trailing truck wheels 30 in. in diameter, with wrought iron spokes and steel tires. The axles, which are of open hearth steel, are 6½ in. in diameter at the center, and the journals of the motor truck are 4¼ in. x 7 in. There are two Westinghouse 50C motors rated nominally at 150 h. p., and the Sprague multiple unit system of control is used.

The outside finish of the car body is in straight panel, tongued and grooved, and the posts and braces are reinforced with extra heavy blocking. The inside body finish is of best African mahogany in natural color, and the ceilings are sky blue with decorations. The cars are painted Aurora red and striped with gold. The sash is glazed with ¼ in. plate glass and made to rise, and the curtains are Pantasote with automatic fixtures. The seats are longitudinal and of the canvas lined spring rattan style, and beneath the section next to the end there is a place for a large controller, lightning arresters, and resistances, which is fireproofed with ⅜ in. asbestos. The bell cord runs through the center of these cars on brass hangers, and the car trimmings throughout are solid bronze of the latest style. The electric lights are equally distributed through the car, a row through the center and a row each side below the clear-story, and there are electric headlights over the hoods and electric marker lights on each end of the car. The general effect is pleasing and the details are thoroughly modern.

Train Accidents in the United States in May.

COLLISIONS.

Rear.

11th, on Northern Pacific, near Leary, Wash., a freight train ran into the rear of a preceding freight, wrecking two cars occupied by workmen. One of these workmen was killed. The wreck took fire and three cars were burned up.

14th, 11 p. m., on Pennsylvania Lines, near Massillon, Ohio, a freight train ran into the rear of a preceding freight, damaging the engine and several cars, and wrecking the caboose. The engineman was injured.

14th, 11 p. m., on Atlantic Coast Line, at Teachey, N. C., a train of empty fruit cars ran into the rear of a preceding train of the same kind, wrecking one passenger car and one express car, which took fire and were burned up. The engineman was injured.

18th, on Pennsylvania road, near Heaton, Pa., a freight train ran into the rear of a preceding freight, wrecking the engine and caboose and several cars. The wreck took fire and the caboose and seven cars were burned up. One engineman was injured.

18th, on Louisville & Nashville, near Mount Pleasant, Tenn., a passenger train ran over a misplaced switch and into some freight cars standing on the side track, damaging the engine and two cars. The fireman and three passengers were injured.

19th, 4 a. m., on Atchison, Topeka & Santa Fe, near Gallup, N. M., passenger train No. 1 ran over a misplaced switch and into some freight cars standing on a side track. The engineman was injured.

22nd, on Pennsylvania road, near Gallitzin, Pa., an eastbound freight train descending a steep grade became uncontrollable and ran several miles at very high speed. Enginemen John Riley and J. F. McNulty, in charge of empty engines standing at McGarvey station, hearing the signal of distress given from the runaway train, started their engines ahead of it on the main track in order to assist in stopping it. In this they were successful, though the engines and a number of cars were derailed and damaged. The fireman on Riley's engine jumped off and was injured. The conductor of the freight was thrown off from the top of a car near Allegrippus and was run over and killed by a passenger train running west.

22nd, 9 a. m., on Chicago, Rock Island & Pacific, near Sheffield, Ill., an eastbound passenger train, about three hours behind time, running at high speed on a descending grade, ran into the rear of a preceding passenger train, badly damaging the engine and two passenger cars. It is said that the foremost train was running at 25 miles an hour and the other one at 60 miles. Only two persons were injured, and they but slightly.

23rd, 11 p. m., on Pennsylvania road, at Leaman Place, Pa., rear collision of westbound freight trains, the engine, three cars and caboose being wrecked. The wreck fouled the eastbound track and a passenger train ran into it. The engine and every car of the passenger train were damaged, all the windows on one side being broken out. Three passengers were injured.

24th, on Atlantic City road, at Tuckahoe, N. J., a passenger train ran into the rear of a preceding freight; engineman and fireman injured. The collision was due to a misplaced switch.

And 23 others on 19 roads, involving 2 passenger and 40 freight and other trains.

Butting.

16th, on Philadelphia & Reading, at Trap Rock, Pa., butting collision between a passenger train and a work train; two trainmen injured.

21st, on New York, Chicago & St. Louis, near Fostoria, Ohio, butting collision of freight trains; one conductor injured.

30th, Delaware & Hudson, near East Windsor, N. Y., butting collision between a freight train and a work train. Both locomotives were running with the tender in front. Both firemen were injured.

And 6 others on 6 roads, involving 1 passenger train and 11 freight and other trains.

Crossing and Miscellaneous.

1st, 3 a. m., on Southern Railway, at Calera, Ala., freight train No. 73 collided with a freight of the Louisville & Nashville at the crossing of that road, and the engine was overturned. Three trainmen were injured and five freight cars were wrecked.

2nd, on Mobile & Ohio, at Fort Jefferson, Ky., a passenger train ran into the engine of a work train, badly damaging both engines. One engineman was killed and the other was injured.

4th, on Buffalo & Susquehanna, near Galeton, Pa., collision of freight trains, wrecking both engines and 10 cars. A boy was killed.

6th, on Chicago, Burlington & Quincy, at Thayer, Iowa, a freight train backing into a side track was run into by passenger train No. 3, and several cars of the passenger train fell down a bank. The engineman of the passenger train was killed and 30 passengers were injured.

7th, on Pere Marquette road, at Saginaw, Mich., collision of passenger trains, damaging several cars. Two employees were injured.

8th, 4 a. m., on Chicago & Eastern Illinois, near Clinton, Ind., a passenger train ran into a gravel train, wrecking the engine, baggage car and four gravel cars. The engineman and 15 passengers were injured.

9th, 8 p. m., at East Fourth street, Des Moines, Iowa, collision between freight trains of the Chicago, Rock Island & Pacific and the Chicago & Northwestern. One engineman was injured.

9th, 11 p. m., on Boston & Maine, at Somerville, Mass., collision between a passenger train and a freight, which was switching on the main track; three passengers injured, one probably fatally.

15th, on San Antonio & Aransas Pass, near West Point, Tex., collision of freight trains; engineman injured.

16th, at Usher's, N. Y., collision between a freight train of the Delaware & Hudson and a freight of the Boston & Maine, which companies use tracks jointly at this point. A brakeman was injured.

20th, on Chicago, Milwaukee & St. Paul, at Oconto Junction, Wis., a freight train ran over a misplaced switch and into the head of another freight standing on a branch, badly damaging both engines and several cars. One engineman was killed and one fireman injured.

25th, 2 a. m., on Delaware & Hudson, near Nineveh Junction, N. Y., 20 cars of a freight train broke away on a steep grade and ran back some distance toward Nineveh and collided with a freight train, broke away were derailed and wrecked. The wreck took fire and

most of the cars were burned up; two trainmen injured.

31st, on Atchison, Topeka & Santa Fe, near Shoemaker, N. M., freight train No. 30, drawn by two engines, was delayed by breaking in two several times; and about 10 p. m., when a westbound passenger train was soon due, the foremost engine was detached and sent forward to hold the passenger train at a station. This engine, when returning to its own train, was not properly controlled and collided with the other engine, throwing it into the ditch and wrecking many freight cars. The foremost engine, having been reversed and deserted, broke away from its tender and ran forward several miles, stopping only a few feet from the westbound passenger train. Three trainmen were injured.

And 26 others on 23 roads, involving 8 passenger and 42 freight and other trains.

DERAILMENTS.

Defects of Road.

1st, on Great Northern, at Benton, Mont., passenger train No. 24 was derailed, apparently by the softness of the roadbed, and the engine was overturned. The engineman was killed.

5th, on Ohio River road, at Atlantic, W. Va., a passenger train was derailed at a defective switch and the baggage car was wrecked. The baggageman was injured.

And 7 others on 7 roads, involving 4 passenger and 3 freight and other trains.

Defects of Equipment.

4th, on Norfolk & Western, at Cooper, W. Va., a car in a freight train which was being pushed up grade by two powerful engines was broken in two in its center. Two tramps were fatally injured.

5th, 2 a. m., on Iowa Central, near London Mills, Ill., a freight train was derailed by a broken wheel and several cars were wrecked. One brakeman was killed and another injured.

22nd, on Great Northern, near Virden, Mont., a freight train was derailed by a broken wheel, and seventeen cars of lumber were wrecked. A man stealing a ride was killed and another was injured.

And 19 others on 17 roads, involving 19 freight trains.

Negligence in Operating.

22nd, on Delaware, Lackawanna & Western, near Newark, N. J., a freight train was derailed at a derailing switch approaching a drawbridge. The fireman jumped off and was injured.

25th, on Pennsylvania road, near Latrobe, Pa., a freight train was derailed at a point where a rail had been taken out by the repairmen, and the engine and six cars were ditched. Four trainmen were injured.

And 14 others on 13 roads, involving 5 passenger and 9 freight and other trains.

Unforeseen Obstructions.

2nd, on Lake Shore & Michigan Southern, near Berea, Ohio, eastbound passenger train No. 10 was derailed by a steel shaft 10 ft. long which had fallen on the track from a westbound freight train. The engine and several cars were damaged. The wreck fouled the westbound track and a freight on that track ran into it, badly damaging the smoking car of the passenger train. In all, four passenger and 12 freight cars were wrecked. Three freight trainmen were injured.

4th, 3 a. m., on Chicago, Rock Island & Pacific, near Unionville, Iowa, passenger train No. 11 was derailed by running over cattle, and three sleeping cars fell down a bank. The engineman was killed and three other trainmen were injured.

7th, on East Carolina road, near Pinetops, N. C., a mixed train was derailed by running over a cow and seven cars were wrecked. One trainman was killed and another injured.

9th, on St. Louis & San Francisco, near Joplin, Mo., a freight train was derailed by running over a cow and the engineman and fireman were killed.

16th, on Union Pacific, near Sharon Springs, Kan., a freight train was derailed at a washout, and the engine and one car of cattle were submerged. The engineman and one brakeman were killed.

20th, on Illinois Central, near West Liberty, Ill., a freight train pushing two coal cars ahead of the engine was derailed by running over a cow, and both the coal cars fell down a bank. A brakeman was killed and four other employees were injured.

23rd, on Pittsburgh, Cincinnati, Chicago & St. Louis, near Jewett, Ohio, a freight train was derailed by running over a hand car, and the engine and 12 cars were ditched. The fireman was injured.

23rd, on Baltimore & Ohio, at Centralia, W. Va., a passenger train was derailed at a washout, and the engine was overturned. The fireman was killed and the engineman badly injured.

29th, St. Louis, Iron Mountain & Southern, near St. Louis, Mo., a passenger train was derailed by running over a cow. One mail clerk was injured.

And 2 others on 2 roads, involving 2 freight trains.

Unexplained.

1st, on Licking River road, near Yale, Ky., a passenger train was derailed and fell down a bank. The engineman was killed.

3rd, 2 a. m., on Chicago & Alton, near Wenona, Ill., a passenger train was derailed and the engine was overturned. Three passengers were injured.

3rd, 4 a. m., on Southern Kansas, near Miami, Texas, a freight train was derailed and two trainmen were injured.

5th, on International & Great Northern, near Round Rock, Texas, a freight train was derailed and seven cars were ditched. The fireman was injured.

8th, on Illinois Central, at Kuttawa, Ky., passenger train No. 102 was derailed and all of the cars but one were overturned. The engineman and fireman were killed and two trainmen and several passengers were injured. The wreck took fire and two passenger cars were burned up.

8th, on Southern Railway, near Trenton, Ga., mixed train No. 135 was derailed and eight cars, including two passenger, were ditched. One brakeman and several passengers were injured.

9th, on Delaware, Lackawanna & Western, at Hoboken, N. J., a passenger train was derailed and the fireman was injured.

9th, 5 p. m., on New York Central & Hudson River, at Chili, N. Y., westbound West Shore passenger train No. 9 was derailed, while running at about 55 miles an hour, and the wreck blocked three main tracks, but no person was injured.

10th, 2 a. m., on New York Central & Hudson River, at Chili, N. Y., a passenger train was derailed at a point where a preceding train had been derailed a few hours before, and two passengers were injured.

11th, on Florence & Cripple Creek, near Leadville, Colo., a freight train was derailed and the engine and nine cars were wrecked. The engineman was killed and one brakeman was injured.

13th, on Illinois Central, near Hazelhurst, Miss., a passenger train was derailed and the engine and several cars were wrecked. One mail clerk and the fireman were killed and the engineman and three other trainmen were injured. It is said that the train was running too fast over a piece of track which was undergoing repairs.

13th, on Seaboard Air Line, near Auburn, Ga., a freight train was derailed and 13 cars were ditched. Two brakemen were injured.

16th, on International & Great Northern, near Willis, Texas, a freight train was derailed.

22nd, 3 a. m., on Southern Railway, near Knoxville, Tenn., a freight train was derailed and two men stealing a ride were injured.

26th, Atchison, Topeka & Santa Fe, at Bragdon, Colo., a freight train was derailed; a brakeman was killed and a tramp injured.

29th, on Great Northern, near Ephrata, Wash., passenger train No. 14 was derailed and the engine and baggage car were ditched. The engineman was injured. The engine was running tender first, and it is said that the tender was the first vehicle to jump the track.

And 53 others on 41 roads, involving 3 passenger and 52 freight and other trains.

OTHER ACCIDENTS.

10th, on Huntingdon & Broad Top Mountain, at Mount Dallas, Pa., the locomotive of a freight train was wrecked by the explosion of its boiler, and the engineman, fireman, conductor and one brakeman were killed.

15th, on Lehigh Valley, near Bloomsbury, N. J., a locomotive pushing a freight train was wrecked by the explosion of its boiler and the caboose of the train was demolished. Two men in the caboose were killed and the fireman was injured.

23rd, on Atchison, Topeka & Santa Fe, near Carrollton, Mo., the locomotive of a freight train was badly damaged by the explosion of its boiler; the fireman was killed and the engineman injured.

And 2 others on 2 roads, involving 2 passenger trains.

A summary will be found in another column.

London's Latest Main-Line Railroad.

If the great success of the Midland Company's coming to London in 1868 had much to do with the Great Central's resolve to do the same 25 years later, it is pretty certain the latter company's failure to improve its position thereby will act as a deterrent to any future schemes of the kind. The last report of the Great Central, for the half-year ended Dec. 31, 1900, is dismal reading indeed, though had it not been for the bad financial position previously existing, it could not be considered worse than that of most of the other lines. It is the same tale, a very substantial increase of traffic much more than swallowed up by increased working expenses. These figures are roundly, £86,500 and £131,000 respectively, leaving £44,500 less available profit than was the case a year ago. Of this, however, £10,000 is due to the fact that last year this sum was taken from the reserve, whilst now nothing is so taken and the real increase in expenses is £121,000.

The Great Central engines, now about 1,000 in number, ran 9½ million miles in the half-year. Most of our lines have succeeded in reducing their train mileage a little, though a good deal more might be done in the same direction; but owing to the opening of the Banbury branch in this case 240,000 more miles have been run. The Great Western are running a service of express trains over this branch, from Oxford to Leicester, using the Great Central station at the latter town. It is hoped to establish a service between Southampton and the Midlands and north of England by this route, avoiding the inconvenience of crossing London. Unfortunately, it takes time to popularize a new route, during which the trains are run at little or no profit.

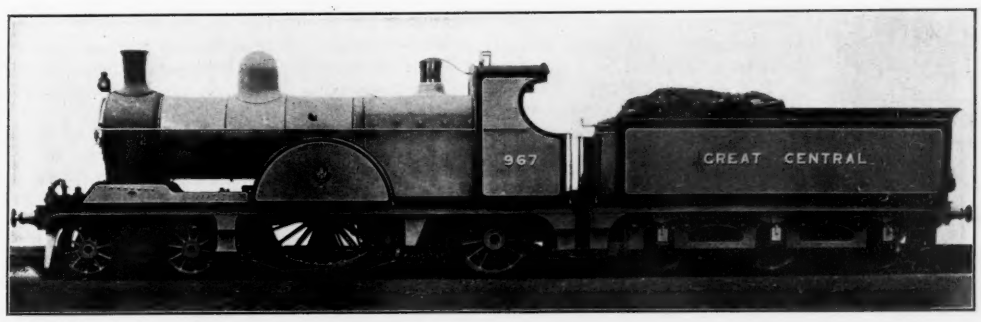
This applies strongly to the Great Central extension to London, which has been open for passenger traffic just two years. The directors report that it is "now slowly growing into favor," and certainly the excellent service and skilful advertising should be doing some good by this time. The difficulties of running very fast over the 40 odd miles of the Metropolitan Railway, with its bad gradients and curves, handicaps the Great Central considerably. It will be, probably, another two years before the company can join hands with the Great Western in a patchwork route to the west of the present one. This will belong partly to one line, partly to the other, and the better gradients will be largely counterbalanced by extra distance. In fine, the great mistake was, not so much the going to London, as doing it by a course which was not absolutely Great Central property every inch of the way.

The net result of the half-year's trading is that none of the preference stocks created later than 1872 receive dividends, and working expenses are 73.23 per cent. of the receipts. In other words, two-thirds of the company's capital gets not a penny of return. Since the beginning of the year, too, the ominous feature of a decrease in traffic has set in, showing that the feverish activity of trade has about spent itself.

Six of the new class of single-driver express engines, fully described with engravings in the *Railroad Gazette* of July 27, 1900, p. 509, are now out. The driving wheels are 7 ft. 9 in. in diam., the bogie wheels 3 ft. 6 in., the trailers 4 ft. 6 in. The boiler is 11 ft. 2 in. long, 4 ft. 3 in. average diam. outside, with 200 1¾ in. tubes giving 1,062 sq. ft. of heating surface. The fire-box of Belpaire type has 132 ft. more, and a grate area of 24.8 sq. ft.; a working pressure of 200 lbs. is used; cylinders are 19½ x 26 in., with piston valves. On the drivers rest 18 tons 7 cwts., the engine weighing full 47 tons 5 cwts. The tender wheels are 4 ft. 3 in. in diam.; at 6 ft. 6 in. centers; 4,000 gals. of water. The engines were designed by Mr. Harry Pollitt, then Locomotive Superintendent, and built at the company's works at Gorton, near Manchester.

W. B. PALEY.

London, March, 1901.



Pollitt's "Single" Locomotives for the Great Central (England).

For Description With Drawings see the Railroad Gazette, July 27, 1900, p. 509.

The New England Railroad Club.

At the May meeting of the New England Railroad Club the principal address was by Mr. Adams, of the *Railroad Gazette*, extracts from which are given in another column. At the close of this address Mr. J. H. Graham gave some interesting data concerning the early history of rail-circuit signaling. He said, in part:

Members, are you aware of the fact that a member of this club is the father of all this thing? A member of this club 30 years ago used the automatic system. I have in my study at home copies of all his patents.

Several years prior to 1870 William Robinson entered upon the development of an automatic electric signal system for railroads, taking out his first four patents in 1870. In the same year he exhibited an elaborate model at the American Institute Fair in New York—a model that cost $250. This model embodied both visual and audible signals, operated electrically at different points along the line by a passing car.

In the following year, 1871, Mr. Robinson put up an experimental installation at Kinzua, on the Philadelphia & Erie, and after several months' experimenting got the system working reliably under the fastest trains. This was an automatic block system with auxiliary alarm bells and tell-tale bells sounding at distant points to indicate the condition of the block.

This installation was what is known as a wire system, that is, wires were used to conduct the currents, and the circuits were controlled by levers contiguous to the rails and operated by the wheels of passing trains in the manner subsequently used for many years by the Hall Signal Company.

After much study, Mr. Robinson invented the rail system, in which the track is divided up into sections, a battery is placed at one end and a relay magnet, controlling the signal circuits, at the other end. This circuit is continuous, and always alive through the rails of the section, the live current keeping the signal at safety. The wheels and axles of the car or train entering upon the section, short-circuits the current from the magnet, which then releases its armature, and the signal is thrown to danger. This is the system used to-day throughout the United States by all signal companies. It was first applied by Mr. Robinson at Kinzua early in 1872.

Mr. Robinson patented this system on Aug. 20, 1872, No. 130,661. This was, no doubt, the broadest and most controlling patent ever issued on automatic railroad signaling. It was considered so original and far reaching that no one ever attempted to infringe it. But as soon as it expired, 1899, every signal company in the United States, notably the Hall Signal Company, seized upon it and made it the basis of their systems.

From 1872 to 1875 Robinson put up a number of installations of rail circuit block signals on the Philadelphia & Erie for regular service, and some experimental blocks on the Baltimore & Ohio, and the Philadelphia, Wilmington & Baltimore; also some about this time in California, in regular service.

In 1875 Robinson went to Boston, and in 1876 he put his first signal installation in New England on the Bos-

ton & Lowell, between Elm street and North avenue, North Cambridge.

On June 14, 1876, Emperor Dom Pedro, of Brazil, accompanied Mr. Robinson on a special train over a portion of the Lowell road to examine this system.

The same year he put installations at Roxbury Crossing and Forest Hills, and Mt. Hope on the Boston & Providence. Within a few months he equipped a large number of switches on the Boston & Lowell and the drawbridge section at Somerset on the Old Colony, and within a year or two after, some ten miles of the Fitchburg.

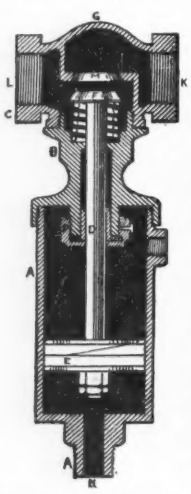
In all the installations which Robinson made in Massachusetts in 1876 and later he used the bond wire to make electrical connection between the adjacent rails of the track, just as it is used to-day. This invention he conceived during his early experiments on the Philadelphia & Erie, and made drawings and descriptions of it long before coming to Boston in 1875. This bond wire is now used on practically all electric railways in the world.

In 1878 Robinson organized the Union Electric Signal Co. He assigned nine patents, as a first batch, to this company on its organization, and originally owned the whole of the capital stock of the company.

In 1879 Robinson went abroad and spent 15 months traveling in Europe, Asia and Africa, returning in 1880. Soon after his return George Westinghouse, Jr., and his associates came to Boston and bought the controlling interest in the stock of the Union Electric Signal Co. They at once removed the headquarters to Pittsburgh and reorganized the company under the name of the Union Switch & Signal Company, which has since introduced the Robinson signal system extensively all over the country. Since that time Robinson has had no active connection with the company.

The Huff Automatic Steam Blower.

The Huff Locomotive Appliance Co., 70 Kilby street, Boston, has recently put on sale the Huff Automatic steam blower, which is here illustrated. With the heavy demand that is now made on all locomotive boilers, the attention a fireman must give to a hand-operated blower is no small part of his duties. Automatic control of the blower as here described can doubtless be used to advantage in much of the average work where the blower is necessary. The device is described as follows:



It has a cylinder 2½ in. diam. x 5 in. long, with a straight-way globe valve attached to the upper end of the packing gland. The piston rod seats the globe valve at its upper end, and on its opposite end is the piston. The globe valve is threaded to the blower pipe at K and L, the former point being the steam intake end. Into the steam chest of the locomotive a half inch pipe is tapped and it is attached to the blower at N, with a globe valve to cut out the automatic action when it is necessary to use the blower while the cylinders are working steam.

When steam is being used in the cylinders, the steam chest pressure on piston E, being greater than boiler pressure on valve F because of the difference in areas, seats the valve and stops the blower. When the throttle is closed and steam chest pressure ceases this action is reversed, valve F is opened by boiler pressure and the blower goes on automatically. As previously intimated, if the blower is needed while the engine is working, the globe valve below N is closed to cut off the steam chest pressure, and the blower valve is opened by boiler pressure.

International Association for Testing Materials.

The American section of the International Association for Testing Materials held its summer meeting on June 29, at the International Hotel, Niagara Falls. The American section now numbers 168 members, about 25 of whom were present at the meeting. The Chairman, Professor Howe, in the course of a brief address with which the meeting was opened, reviewed the work which the organization is attempting to do, emphasizing its importance in a statement to the effect that the purpose of the Association is to reduce friction between buyer and seller. This it proposes to do by fixing standards which shall be so simple and plain as to give promise of being generally accepted.

The principal business of the meeting was the consideration of ten specifications submitted in behalf of Committee No. 1 by its Chairman, Mr. William R. Webster. The subjects covered are as follows:

Structural Steel for Bridges and Ships.
Structural Steel for Buildings.
Open-Hearth Boiler Plate and Rivet Steel.
Steel Rails.
Steel Splice Bars.
Steel Axles.
Steel Tires.
Steel Forgings.
Steel Castings.
Wrought Iron.

Specifications covering these subjects had been submitted at a previous meeting, and had been referred back to the committee for further consideration. In presenting the amended forms the committee was careful to show each change which they proposed, and these only constituted subjects for discussion. The meeting finally resolved to accept as standards of the American Section the ten specifications submitted, provided that upon letter ballot 70 per cent. of the members voting approve. If thus approved, these specifications will be presented as representing the American view upon the subjects covered, at the next International Congress of the Association, which is to be held at Buda-Pesth in September.

Those who may have occasion to review these specifications are likely to be disappointed in them if they fail to keep in mind the fact that the effort has been to include only those things to which all interested are likely to agree. Matters which are evidently debatable have been avoided. No form of test is called for, the significance of which is not perfectly understood. For example, it was shown in the discussion of the steel rail specification that some members of the Association had desired to have included a requirement as to maximum deflection under the drop test, but the committee had declined to add such a requirement, because, as stated by Mr. Webster, no one could be found who from actual experience could say what should be the deflection of a given rail under given conditions of test. For this reason the addition of such a requirement must await developments. The plan has been to establish a foundation which will be safe and reasonably complete for any who may care to adopt it, and which may be added to as experience or individual need may suggest or require. An estimate of the specifications based upon this understanding cannot fail to give them high value.

Under the head of miscellaneous business, resolutions were adopted instructing the American representative to the Buda-Pesth Congress with reference to the desire of the American Section in certain matters affecting its relations with the International Council, and Mr. Albert L. Colby was elected to succeed himself as a member of the Executive Committee of the American Section.

Spliced Car Sills.

One of the questions for topical discussion at the Master Car Builders' convention was: "Are there any objections to splicing sills in long passenger equipment; if there are, how should this be done according to the best modern practice?" The discussion was opened by Mr. Pflager, Mechanical Superintendent, Pullman Company, and his remarks on the subject are printed practically in full below.

The practice followed by a large number of car builders is to make one splice in the sills of cars 50 ft. and over in length, and this may be taken as a strong indication that there are no objections to splicing sills in long passenger cars; and it may be safely said that if a sill of a passenger car has one splice in it, properly made, it is as strong as a continuous sill. Practice has demonstrated that a properly spliced sill will last as long as a continuous sill, and can be safely used for both side sills and draft sill. The practice of the Pullman Company for the last 20 years has been to make one splice in each of the sills under its cars, and a careful examination of sills which have been in service for many years shows the splice to be in almost as good condition as day applied, and no indication of having pulled apart or opened. I quote from a letter of Mr. George W. West, Superintendent Motive Power, New York, Ontario & Western Railway:

"We send you portions of two passenger car sills that have been spliced and in service for 16 years, and have not had a wrench applied to a bolt or nut used in the splicing. Sills were removed on account of rotten end sills and the tenons on end of draw sills were slightly decayed, and we thought it advisable to remove them; the balance of the sills were as good as the day they were first applied and in as good condition as the section we send you—no indication of either dry or wet rot, and the same condition prevailed throughout the entire sill, except the tenons on the end. The original floor or deafening ceilings have never been disturbed, which is proof positive that the nuts and bolts securing the splices have never been tightened. I take this interest in the matter from the fact that I was associated with the West Shore road when duplicate coaches were furnished that company, and was very strong in my objections to the spliced sills. Experience convinces me that I was wrong in my conclusions, and that the spliced sill, if the work is well done, is fully as strong as the sill without splices. I have watched this matter very closely, and have been an advocate in the conventions of allowing sills to be spliced on freight cars, and I assure you that it gives me as much pleasure as it can your company gratification to see these results."

From the foregoing, as well as our own observations, we feel safe in saying that there are no objections to splicing sills in long passenger car equipment, providing the splice is properly made, but on the other hand, there are some advantages in splicing passenger car sills, the chief of which is better quality of lumber which is obtained in the shorter sills. A car builder can readily obtain first-class sills 40 ft. and under in length, while it is almost impossible to obtain good sills of 60 ft. or over in length. Should sills 60 ft. or over in length be ordered it would be found that delivery was very slow and the lumber of inferior quality; but on the other hand, sills of 40 ft. or under in length can be furnished promptly by almost any lumber dealer, and a far better quality of lumber obtained. It is cheaper to use sills with one splice, made of two pieces 40 ft., or under, in length, rather than to purchase a continuous sill about 70 ft. long, as the latter will cost from 40 to 50 per cent. more per thousand feet than the shorter sills. The cost of splicing a sill varies according to the splice made, and will run from $1 to $1.60 per sill. Taking a 70-ft. car, the saving in lumber by use of spliced sills, as compared with continuous sills, would amount to $39.70 a car; deducting the cost of splicing, $9.60, leaves a net saving per car $30.10.

Should it be granted that there are no objections to splicing sills on passenger cars, the question is: How should it be done according to the best modern practice? It is our opinion that what is known as a lock splice is the best, the same as is used by a large number of railroad companies in this country, and also in foreign countries, and that the length of the splice should be four times the width of the sill, and that the splice should be bolted together with two or more bolts. It is advisable to re-enforce the sill on the side with an oak block 2½ in. wide, depth of sill and about 6 ft. long, bolting the re-enforcing blocks securely to the sill. With such a splice the sill is stronger at the point of splice than at any other point, both for resisting a downward load, and for cross blow or strain.

In splicing sills it is important that the splice be made over or very close to the center cross ties or needle beams of the cars, and that the splices be divided over the two center cross ties, the splice of the first sill being over one center cross tie and the second sill over the other center cross tie, about 10 ft. away, and the third splice again over the first cross tie, thus alternating the splices of the sills above the cross ties. In arranging the blocks or strengthening pieces on the side of the sill they should be placed on the inside of the outside sill, outside of the intermediate sill and inside of the center sill, so as to counteract each other in any bending movement caused by the car being struck an end blow.

It was voted that a committee be appointed to take the subject into consideration with a view to presenting it to the Association as recommended practice, the committee to consider all kinds of splices, the way the splice is made and the location of the splice with reference to the length of the car.

The Woods Self-Oiling Loose Pulley.

The advantages and economy in the use of a reliable self-oiling loose pulley must be acknowledged when the almost constant annoyance and expense, caused by the ordinary pulley or an inferior self-oiler is considered.

The pulley illustrated here revolves on a sleeve which is fastened to the shaft; large holes in the sleeve extend from end to end, and form capacious oil spaces, from

which the small radial holes conduct the oil to the bearing surfaces. When the shaft is revolving, the oil is carried to the bearings by centrifugal force; when belt is on the loose pulley and the shaft is at rest, oil flows by gravity to the bearing through the lower rows of holes. No felt, wick or fabric of any kind is used as an oil retainer, and after the pulley is once thoroughly lubricated, it does not require re-oiling oftener than once a month under ordinary usage, and in some instances it has been known to run as long as ten months without being re-oiled.

This self-oiling loose pulley is made by the S. A. Woods Machine Co., South Boston, Mass. It is furnished with all of its machines, and can be supplied for any work where a loose pulley is required.

Since 1854 the Woods Company has been engaged in the manufacture of wood-working machinery, adapted to the requirements of car and repair, pattern and carpenter shops.

William Bliss.

The retirement of Mr. William Bliss from the active management of the Boston & Albany brings to a close an administration which has lasted nearly half a century; for Mr. Bliss, who has been president of the road since 1880 and actively connected with it since 1865, made no radical change in the conservative yet enterprising policy of his father-in-law, Chester W. Chapin, who became president of the Western Railroad in 1854, and continued in that office until 1879. (The consolidation of the Western with the Boston & Worcester, took place in 1867. The short

administration of D. Waldo Lincoln, which was brought to an end by his untimely death in 1880, made no break in the well-established policy of the company. Up to about 1883 the State of Massachusetts owned some of the stock in the road, and appointed five of the directors, but the President has been the real leader during all these years, and the harmonious spirit of the Board of Directors has been proverbial. We do not recall a single road, certainly none which is anywhere near so large, which has been conducted for so long a time with so little change in ownership, in its relation to the public and in its general policy.

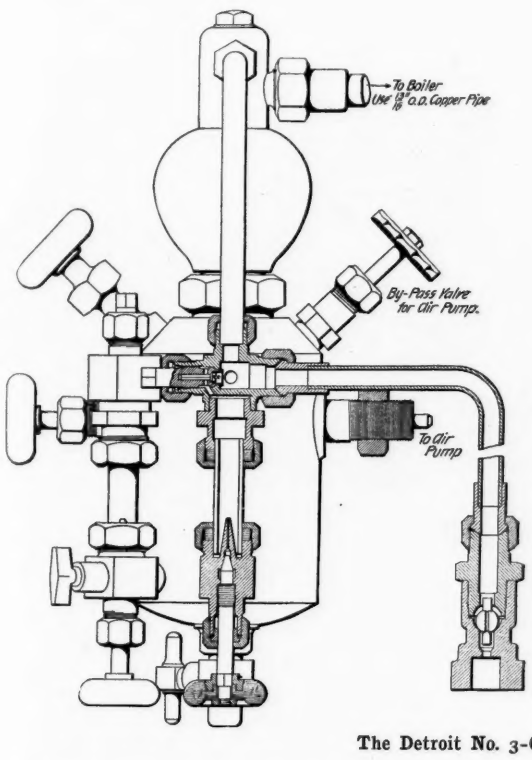
It is unnecessary to speak in this place of the characteristics of this policy. The Boston & Albany has been a conservative company, in the best sense, and its financial solidity has from the establishment of the corporation (1867) been the envy of all railroad officers. It has withstood without a shock all vicissitudes of hard times and of the establishment of competing routes. While constantly conservative the management has distinguished itself by taking a foremost part in some of the most radical railroad improvements; such as heavy rails, the best passenger cars, automatic block signals, interlocking signals, continuous steam heating of trains, lighting of cars and handsome stations. It is only simple justice to say that Mr. Bliss has taken a very lively personal interest in all of these things, as indeed will be recalled by all who have had occasion to discuss the various projects with those operating officers who had them directly in charge.

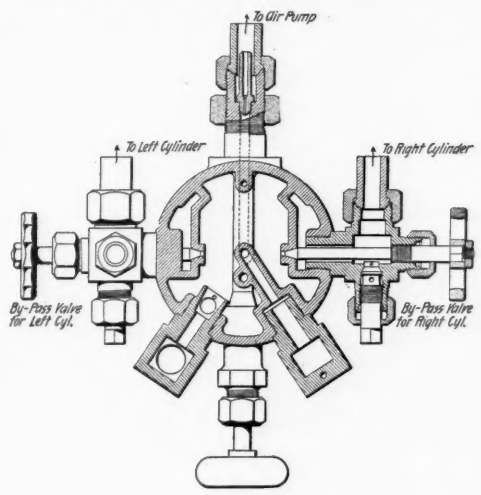
Last, but not least, Mr. Bliss is credited with having been the leading spirit in making the Boston & Albany more noted than any other road in the country for the extent and the good taste of its landscape gardening; though in this as in other matters his extreme modesty has kept the fact from being very generally published. The road has more really artistic stations than any other; in proportion to its length, and probably very far more; and both in this particular and in landscape gardening it was one of the two or three pioneers.

Mr. Bliss was born in Springfield in 1834, and was General Freight Agent for six years and General Manager for eight, before becoming President. He continues, of course, to hold the office, now mostly ornamental, of President of the Boston & Albany, and he is a director of the New York Central.

The Detroit No. 3-C Lubricator.

The illustrations show the new style 3-C triple-feed lubricator, 1900 pattern, exhibited by the Detroit Lubricator Co., at Saratoga, and referred to in the *Railroad Gazette* June 28. Our readers are generally familiar with the Detroit lubricator, and it is therefore only necessary to show the improved design and note its specific differences from earlier types.





The Detroit No. 3-C Lubricator.

This latest type has automatic steam chest plugs of good design, and also it has by-pass valves for auxiliary oiling. These by-pass valves dispense with the hand oilers previously used for auxiliary oiling in case of broken feed glasses or other emergency. The by-pass valves should be kept closed except in such cases. When it is necessary to use the by-pass for oiling, the feed regulating valve at the bottom of the glass must be closed and the by-pass valve opened to the desired amount of feed. The feed-regulating valves below the sight glasses, and the by-pass valves are graduated to deliver equal feeds for equal openings; that is, if a quarter-turn of the valve gives the necessary amount of feed on the sight glass valve, the same amount of oil will be fed by opening the by-pass valve a quarter-turn, when it is working in substitution for the regular sight feed.

There are no choke valves in this lubricator, the choke action being obtained by the grooved ball-and-pin valves in the steam chest plugs. The steam chest pressure in the tallow pipes is met and equalized by steam led down to the lubricator in branch pipes supplied with steam from the boiler head. The small double-acting ball choke valves automatically take care of all variations of steam chest pressure, and their stems playing in the steam chest plug apertures keep those passages free from accumulation of gum or other obstruction to the passage of oil.

June 28 we gave a list of 291 Detroit lubricators that have recently been ordered for locomotives now being built for nine prominent railroads, which is a substantial endorsement.

Rapid Telegraphy.*

BY WALTER P. PHILLIPS.

Up to the present time the automatic telegraphs have belonged to that class of inventions in which more money was invested than has ever been taken out. There are those who will contend that the Wheatstone has certain advantages, but it is doubtful whether the introduction of that exquisite system has led to any real progress. A great deal has been claimed for it in England, but recent reports show that it has lost ground there, while in the United States it cuts no important figure.

Mr. Phillips then gave a brief description of the Wheatstone apparatus, praising its mechanical perfection, but asserting that the errors in receiving by eye instead of ear, and the delays in perforating made it inferior to the Morse. The public learn the difference and favor the Morse. The Wheatstone is only a partial success. He continued:

The other fast methods, all inferior to the Wheatstone, depend on the use of chemically prepared paper at the receiving end of the line. There have been no end of these systems, with their wet paper and other objectionable features, and for the exploitation of several of them independent companies were formed, all of which went to the wall long ago. Not one of them is in use in the whole world to-day, as far as I can ascertain. The automatic telegraph in its original form has practically been discarded in favor of the primitive Morse which is by common consent, the simplest and fastest in the world. . . . The Phillips-Morse Automatic Telegraph is a very unpretentious affair, using the Morse key for the preparation of an embossed tape which, without the slightest delay is passed through a transmitter and over the line at a high rate of speed. The signals are received, at the remote station, on a recording apparatus which furnishes an embossed slip from which, when passed through a reproducer, the words as originally written by the sending operator are reproduced on a sounder and taken down with a pen or a typewriter by sound. An article from the New York *Sun*, which I did not write or inspire, says:

"Phillips' Morse Automatic Telegraph will double or treble the number of words that can be sent over a single wire, and this without requiring that the operators learn anything beyond that which the present Morse operators know now. When there is no need of hurrying matter forward over the wires the rapid system can be cut out by changing a plug. The transcribing operator can vary the speed of the tape as it goes through the machine to suit himself, can stop it at any point, and can pull it back if he wants it repeated."

House invented a printing telegraph away back in the fifties; Hughes invented one not so good, and afterwards George M. Phelps combined the two and produced a really beautiful machine. Edison interested himself in the stock ticker, and as far as short distance printing telegraphs went, we had made progress twenty years ago. But what was needed was an automatic page printer that would work on long circuits and Mr. Donald Murray seems to have come nearer to attaining this ideal than anyone else. The Murray system involves the use of a perfected slip which is prepared on a machine which to all intents and purposes is a typewriter. This perforated slip is passed into the line at a moderately high rate of speed, and the pulsations caused by it, produce a perforated slip at the remote station which when applied to a specially arranged typewriter causes it to print in Roman letters, that which was originally perforated at the sending station. There are some obstacles to be overcome before this system can be made a great and enduring success, but it is full of promise.

*A paper read before the Railway Telegraph Superintendents' Association at Buffalo. Condensed.

Cipher Code for Railroad Telegraphing.*

BY C. S. RHOADS.

While no doubt the majority of the railroads here represented have, or have had some form of cipher code, the fact that your topic committee has asked us to consider the question at this convention, must be taken as evidence that there is need of improvement. Judging principally from my own limited experience I am of the opinion that we need a code that will apply to the stereotyped phrases used in the different departments of the railroad service, and to have it adopted as the standard for North America, the action to make it so presumably to come through the American Railway Association.

On the Big Four we prepared a code specially for the local freight department, and put it in use between three of the largest cities. The result was satisfactory so far as applied to the local business of our own road, but when it came to the joint service with connecting lines we soon observed the necessity for a standard for all roads to make it thoroughly practicable. Our traveling auditors have a code of their own, which only the general auditors and traveling auditors have copies of, for obvious reasons.

The Association of American Railway Accounting Officers have adopted a code which contains the basis of what might be enlarged upon to fill the requirements of every department of the service. It contains numerous sub-divisions, one for each department. For example: Car Service Department....cipher words beginning with "C." Freight Auditing and Fr't....cipher words beginning with "F." General Freight Department..cipher words beginning with "G."

Each sub-division is arranged in alphabetical order, this arrangement being considered better than an arrangement by subjects, for the reason that no two persons would have the same idea as to the best way of classifying subjects. By having the code words in each sub-division begin with a letter having a direct connection with the department using that sub-division, instant reference can be made to the proper part of the code when a message is to be interpreted. They inserted a number of extra code words in each sub-division, with the understanding that after the code was adopted by the Association, any road wishing to add one or more phrases might apply to the secretary to insert such phrases, designating a code word for each, and notifying all members of the Association by the monthly bulletin.

In addition to a code of the nature outlined above, would it not be well to have a private code for the use of presidents, general managers and general superintendents only. There are often telegrams pertaining to the executive and administrative affairs of the service that should be so strictly private that not even the clerks in their own offices should have copies of their code. It is not my purpose to insert herein a list of code words to be recommended. One can soon be arranged after the matter of adopting a standard has been perfected.

*A paper read before the Railway Telegraph Superintendents' Association at Buffalo. Condensed.

RAILROAD GAZETTE

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EDITORIAL ANNOUNCEMENTS.

CONTRIBUTIONS—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussion of subjects pertaining to ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

ADVERTISEMENTS—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and these only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially either for money or in consideration of advertising patronage.*

On another page is a short abstract of a circular letter issued by the French Minister of Public Works in the matter of sanitation. In the course of this letter mention is made of the undesirability of covering upholstered seats with a fabric having a long pile. This suggests an idea which has often occurred to us and which was especially brought to mind in reading in the *Railroad Gazette* the other day an account of certain work that is going on at Altoona. It appears that careful investigation is under way there of plushes suitable for upholstering cars. But why should plush be used for this purpose? We suppose it is because it may be very durable, but perhaps even more because it has a showy (if not rich) appearance, and so gives to car furniture a certain air of luxury. Aside from these two qualifications it seems to us, and long has so seemed, about as ill-adapted as any material could be to the purposes of upholstering cars. In Great Britain and on the Continent, and especially in Great Britain, these matters are better arranged. We say this with humility because we know that it is "un-American." The judicious traveler will observe, however, that first-class compartments in Great Britain are upholstered in broadcloth, a fabric which is close in weave, has a fine hard surface and, while expensive, is durable. In impermeability and in the ease with which the surface may be cleaned it approximates leather (although it is not so good in these respects), while it is not so slippery. For another class of upholstery a sort of mohair stuff is used. We are not skillful enough in dry goods diagnosis to say just what this stuff is, but it is hard and smooth. In our own country we have some admirable imitations of leather which are durable and handsome, and yet cheap. Whether or not the traveling public would be satisfied with these instead of plush we do not attempt to guess.

French Colonial Railroads.

We are apt to forget that France still has colonies, so-called; for these colonies for the most part are destitute of colonists, and the part France takes in them is chiefly to govern them, direct their public works, police them with soldiers, French and native—and pay the deficits which are incurred in most cases.

The French foreign possessions of this time offer no such opportunity as those of England in America and Australia have given, the like of which no longer exist on the globe. The great distinguishing feature of the latter was that they were practically uninhabited, and offered illimitable areas of fertile land, undeveloped forests, mines, etc., in climates healthful to emigrants from the colonizing country, which has not only exploited these new countries but peopled them; and by far the most important element in their exploitation has been the people thus introduced, with habits of industry, energy, enterprise, and economy—immensely more important than the capital supplied by the old country, or the intelligence and ability exercised in the old country for the prosecution of enterprises in the new, valuable as these latter have been in many cases.

Now since France lost Canada its so-called colonies have been, with unimportant exceptions, territories already well peopled, but with populations of a low industrial civilization, as in Algeria and Cochin China, or quite barbarous, as in its immense territories in tropical Africa and Madagascar. In such districts, an indispensable pre-requisite to a colonial growth like that of the United States formerly, and of Canada and Australia in these days, is the removal of the existing population, which in all these cases fully occupies the country, and in some of them is dense. Whether the French people are fitted to colonize a new country as North America has been colonized, we may not consider: at present they have no such opportunity; and English experience in India and elsewhere shows that the great colonizing country after a century and a half of domination has left these well peopled "colonies" still occupied almost exclusively by their native inhabitants. Out of more than 250 millions of inhabitants in British India, barely 250 thousands are of the European race. We are now making our first experiments with colonies, if they may be so called, of the French kind. Puerto Rico and the Philippines are full of people, of a kind different from ourselves, among whom no large immigration of American or Europeans is possible, and who cannot be expected to advance in industrial civilization at anything like the rate which we are accustomed to. Their resources may be exploited to a certain extent—on the whole doubtless to a large extent—by American and European capital and intelligence; but almost exclusively by native labor, and this means chiefly by native intelligence; for it is the brains of the millions of farmers, mechanics, merchants, etc., employed directly among the undeveloped resources of the new countries that have had the chief part in the marvelous growth of wealth and prosperity of this country and others similarly situated.

The French colonies are under the care of a special minister in the French cabinet, and a special bureau of this ministry has supervision of the public works throughout this vast domain, in Asia, Africa and America. This bureau's work is largely concerned with the railroads by which it is hoped to develop the resources of the several colonies. A writer in the *Journal des Transports* summarizes the work which it has on hand or contemplates, which summary we have corrected in many cases, and which thus corrected appears below.

In Algiers, the Southern Oran Railroad, which is the line which penetrates furthest south, and will be the northern section of the line across the Sahara, if that wild scheme is ever realized, has been extended but little east of the Morocco border, nearly as far as the Morocco town of Figuig, a distance of about 400 miles from the Mediterranean coast.

In the French Soudan a railroad has long been under construction from navigable water on the Senegal River at Kayes, some 350 miles from the coast, and near the 15th parallel north, to navigable waters on the Niger at Bamaku, about 300 miles. This has now been completed for about half its length. The Niger from this point flows in a generally northeastward direction past Timbuctoo, seven or eight hundred miles, before turning southeast and south to the sea, some 1,300 miles further. Further south, in French Guinea, another line from the coast at Conakry to a much higher point on the Niger, also about 300 miles long, has been surveyed, and a contract let for the construction of 75 miles. On the Ivory Coast, which is in latitude 5 north, and just below Liberia, a line has been projected from the new capital of the colony, Bingerville, inland to Baoulé, and 116 miles has been surveyed and the plans are under consideration in the Ministry, which hopes to be able to begin construction next year. In Dahomey, which is a little colony, separated from the last named by the British Ashantee and the German Togo (Gold coast), a line from the coast inland (north), 173 miles, has been surveyed, and a contract has been let for a part of the work. There is talk of extending this line north some 400 miles to the Niger in its lower course.

This is the southernmost of the French African possessions on the Atlantic coast. On the east coast it has the small colony of Somali (bordering the much larger British Somaliland) extending inland from the mouth of the Red Sea to Abyssinia. Work was begun in 1897 on a line from the coast at Djibuti southward to Harrar, in Abyssinia, and last July the road was opened for 67 miles, to Dawanlé, the first station in Abyssinia, and work is going on beyond.

Madagascar, which has an area about equal to that of all our Atlantic states north of South Carolina, and a population of three and a half millions who are not Africans, but, all things considered, perhaps worse, has had capital granted for a railroad from Aniverano, the head of navigation on the river Vohitra, which empties on the east coast, westward to the capital, Antananarivo, 180 miles. There is no harbor at the mouth of the Vohitra, and part of the plan is the construction of a canal, or improvement of an inland passage, northward along the coast to Ivondro, whence a railroad six miles long is already in operation to Tamatave, the chief port of the island. The construction of this line has been urged to avoid the deadly effect of even a short journey over the lowlands to the hills, the Madagascar coast being, apparently, one of the most unhealthy in the world.

In Cochin China, the French Parliament provided in 1898 for a system of 1,050 miles of railroad. By the middle of July, 1900, a line 96 miles had been completed from Hanoy by way of Lang-song to Chinaport. The French government has obtained from China the right to build several lines in Southern China to connect with this. The recent outbreak at Pekin prevented the beginning of work on these lines, but it is announced that bids will soon be received for the Yunnan Railroad, passing by way of Lao Kai and Mong-Tse.

In French Guiana, a concession was granted in 1900 for a railroad from Cayenne to Saut-Canouri, with two branches, about 250 miles in all. Only about one-fourth of this has been definitely located.

May Accidents.

Our record of train accidents in May, given in this number, includes 78 collisions, 127 derailments and 5 other accidents, a total of 210 accidents, in which 33 persons were killed and 138 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted, except where the circumstances of the accident as reported make it of special interest.

These accidents are classified as follows:

Collisions:	Rear.	Butting.	Crossing and other	Total.
Trains breaking in two	3	0	0	3
Misplaced switch	4	0	5	9
Failure to give or observe signal	3	0	3	6
Mistake in giving or understanding orders	0	0	1	1
Miscellaneous	9	0	4	13
Unexplained	14	6	26	46
Total	33	6	39	78

Derailments.

Broken rail	1	Misplaced switch	5
Loose rail	1	Derailing switch	5
Defective bridge	1	Negligence of trackmen.	1
Defective switch	4	Open draw	1
Defective frog	1	Unfastened switch	1
Soft roadbed	1	Careless running	2
Broken wheel	8	Bad switching	1
Broken axle	4	Animals on track	5
Broken truck	3	Washout	3
Fallen brake-beam	1	Accidental obstruction	3
Brake hose burst	2	Unexplained	69
Failure of drawbar	2		127
Broken siderod	1		
Broken car	1		

Other Accidents.

Boiler explosion	3
Cars burned while running	1
Other causes	1
	5
Total number of accidents	210

A general classification shows:

	Collisions.	Derailments.	Other accidents.	Total.	Per cent.
Defects of road	0	9	0	9	4
Defects of equipment.	3	22	3	28	13
Negligence in operat'g	29	16	1	46	22
Unforeseen obstruct's.	0	11	1	12	6
Unexplained	46	69	0	115	55
Total	78	127	5	210	100

The casualties may be divided as follows:

Killed:	Collisions.	Derailments.	Other accidents.	Total.
Employees	5	17	7	29
Passengers	0	0	0	0
Others	1	3	0	4
Total	6	20	7	33
Injured:				
Employees	30	36	2	68
Passengers	55	11	0	66
Others	0	4	0	4
Total	85	51	2	138

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

	Pass. killed.	Pass. injured.	Emp. killed.	Emp. injured.
Defects of road	0	0	1	1
Defects of equipment	0	0	8	3
Negligence in operating	0	55	5	35
Unforeseen obstructions and maliciousness	0	0	8	14
Unexplained	0	11	7	15
Total	0	66	29	68

Twenty-four accidents caused the death of one or more persons each, and 33 caused injury, but not death, leaving 153 (73 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with May of the previous five years shows:

	1901.	1900.	1899.	1898.	1897.	1896.
Collisions	78	88	65	68	33	34
Derailments	127	134	108	76	46	73
Other accidents	5	9	8	6	8	2
Total accidents	210	231	181	150	87	109
Employees killed	29	36	22	28	11	17
Others killed	4	10	42	8	5	15
Employees injured	68	86	60	78	17	39
Others injured	70	46	148	60	48	37
Average per day:						
Accidents	6.77	7.45	5.84	4.84	2.80	3.52
Killed	1.06	1.48	2.06	1.16	0.84	1.03
Injured	4.45	4.26	6.07	0.45	2.10	2.45
Average per accident:						
Killed	0.16	0.20	0.35	0.24	0.18	0.29
Injured	0.66	0.57	1.15	0.92	0.74	0.70

We have no record of any passenger being killed in a train accident in May. This is the first month thus free from fatalities since April, 1898.

The most fatal accident in the present record is the locomotive boiler explosion at Mount Dallas, Pa. The two most remarkable accidents in the record occurred on the same day, the 22nd; one at Gallitzin, Pa., and the other at Sheffield, Ill.

Accidents on electric railroads have come in for about as much notice in the newspapers during the month under review as those on standard railroads. The number of accidents of which we found reports was 15, in which eight persons were killed and 149 injured. Five of the deaths and 60 of the injuries are chargeable to a butting collision on the Albany & Hudson, near Greenbush, N. Y., on Sunday, the 26th. An eastbound car ran past a sidetrack, where it should have waited, and collided with one moving westward at such high speed that both cars were completely wrecked. In view of the severity of the collision the number of fatal injuries appears small. The conductor of the eastbound car noticed the motorman's error as soon as the car passed the point where speed should have slackened, and he at once gave the stop signal, but not in season to prevent the collision. Both of the motormen were killed. Whether or not this road, like so many other electric lines, ignores the plain lessons of experience which are on record in the history of steam railroad operation for the past 60 years, we do not know; but it may not be out of place to observe that the lessons of this collision are quite simple. One of them is suggested by the reported testimony of an officer of the road, at the inquest, that he did not know of any rule which excused the conductor from giving the bell-cord stop-signal on approaching the passing-station. (Evidently there was no rule requiring it; conductors do not ordinarily signal a motorman to stop except when there are passengers to get off or on.) The lesson of the collision in this regard is that the rule of the Cincinnati, New Orleans & Texas Pacific (and a few other roads) should be adopted to cover cases like this; the rule that the conductor of a passenger train must always give the engineman (motorman) the stop signal on approaching a station where another train is to be met. We mention this rule because it has been used with satisfaction by careful railroad superintendents for many years; but the best preventive of collisions is the space-interval rule; and if a road runs cars at 40 miles an hour the fact that its motors are electric instead of ordinary steam locomotives makes no difference, so far as this principle is concerned. The space-interval rule is particularly to be recommended to single-track electric roads running numerous trains at regular intervals, for their conditions are such that they can adopt it without great expense; they can use the old-fashioned English train-staff. American steam railroads have thought that they could not use the staff (without electric interlocking) because they could not afford to stop the trains at every meeting point; but the objection should not be so weighty with the average electric road, for their passengers are educated to put up with frequent stops and delays.

Coroner E. L. Smith, of Binghamton, N. Y., has rendered a verdict on the deaths of the five men killed by the explosion of dynamite which was caused by a rear collision of freight trains on the Delaware, Lackawanna & Western at Vestal on the night of June 8. The Coroner finds that the engineman of the second train was criminally negligent. He was able to see, and did see, the tail lights of the preceding train more than a mile away, but he stepped back to the tender to get a drink of tea from his pail, and to speak to the fireman, and this, says the Coroner, took a minute and a half; and when he returned to the cab it was too late to stop his long train, which consisted of two engines and 68 cars, the cars being nearly all loaded with coal. The brakeman of the foremost train is also held guilty of criminal negligence in not going back with stop signals. Nothing is said about the responsibility of the runner of the second engine of the second train. The Coroner recommends that the State Railroad Commissioners take action to have the transportation of explosives more strictly regulated by law. It occurs to us that a very desirable restriction would be a legal limit on the distance that explosives may be carried by rail. It was said that the dynamite which exploded at Vestal was on the way from New Jersey to Minnesota, or somewhere up that way. It would require both state and federal statutes to carry out such a restriction; and to this limit the markets of manufacturers would result in some hardship; but the end justifies the means. As long as we have disastrous derailments due to unavoidable causes—to say nothing of accidents which can, or ought to be, cured—the transportation of dynamite a thousand miles over railroads crowded with trains involves a risk which should not be taken. It is an unnecessary risk; or if not should be made so, for the possibilities of damage are very great. The Vestal explosion broke plate glass windows nine miles away, and was felt for 30 miles. It has been suggested that dynamite might be carried in special trains; but that does not get rid of one of the worst elements of risk, the danger of a derailment caused by an accident to a train moving rapidly in the opposite direction on an adjacent track. To get the desired benefit from a special train we should have to adopt the plan of the late Queen of England, for whom the London & North Western not only ran a special train, but also commanded all other trains to come to a standstill before the Queen's train approached. The public could hardly afford that for a few hundred dollars' worth of dynamite.

The plan by which the Norfolk & Western distributes cars to shippers in the Pocahontas coal district is characterized by Judge Jackson of the United States District Court as unique; and the agreement on which it is based is of interest to railroad men as containing a proviso by which a coal shipper apparently agrees to voluntarily forego his natural advantage of nearness to the seaboard, except when business is unusually brisk. The decision from which we take these facts is reported in another column. The plan of distributing coal cars according to the number of coke-ovens, appears to have been in use a number of years. The arrangement for giving the older mines 1,500 cars, plus what they may secure from the general (unreserved) stock of cars, must obviously be subject to modification, if new mines are frequently being opened, for the proportions of tonnage shipped from the several mines or groups of mines must vary. But assuming that the plan works all right, it would seem that while cars are plenty all around, it must be of little or no value to those whom it favors, for the west side shipper has the advantage of the same rate as his east side competitor, and has all the cars that he wants. But as soon as a scarcity comes on, the west siders will naturally demand, we should think, that the east siders be made to get along with their 1,500 exclusive cars and no others. The majority of traffic managers will probably find little to profit them in this example of Norfolk & Western practice, for they are not so fortunately situated. On many roads the question how to segregate cars for a particular territory without doing injustice to other territories served by the same railroad company would be a hard one to decide. And, if an apportionment were never so fair, its fairness would surely be challenged in time of stress. Not the least interesting feature of this decision is the incidental allusion to Judge Cooley's dictum. A good many violations of the spirit of that rule take place, no doubt, every day, though not, perhaps, to the extent of "driving out of business" the competitors of the shipper who owns his cars. A private car owner probably causes most trouble in those cases where he does not drive his competitor out of business, but does cause him constant annoyance and petty loss. But how can a railroad get rid of the private car owner? Many roads would like to throttle him, but do not know how to go about it.

Recent Block and Interlocking Signaling.*

Mr. Adams described, with the aid of a number of lantern views, the following recent installations of block and interlocking signals, viz.: New York Division, Pennsylvania Railroad; four-track line; distant signals worked by track circuit with polarized relays without line wire. Boston Elevated Ralroad; electro-pneumatic block signals, for trains running one minute apart. Lehigh Valley Railroad; equipment of automatic signals through from New York to Buffalo. Delaware, Lackawanna & Western Railroad; automatic electric motor semaphore. Southern Pacific Railroad; automatic block signals on single track; motor semaphores worked by storage batteries. Pittsburgh, Fort Wayne & Chicago Railway; four-track line; automatic signals on bridges; three-position semaphores, doing away with distant signals; motor semaphores, worked by storage batteries. Electro-pneumatic interlocking at South Station, Boston. Low pressure pneumatic interlocking at Grand Central Station, New York. The Taylor electric interlocking machine on C., C., C. & St. L. and C. & N. W. Railroads. The Webb & Thompson electric interlocking on the London & North Western.

Continuing, he said:

I shall not essay to give a critical estimate of the relative merits of the respective devices and methods, for these merits are in many respects so nearly equal that only a most thorough and scientific investigation and test would reveal the differences on which to base a choice of one style in preference to another. The railroads, and the people who ride over them, are to be congratulated on the fact that equally enterprising men are at work in so many different directions, developing so rapidly the art of signaling and the appliances used in carrying it out. Electricity is a chief element in all the block signals which have been referred to, and in all but one of the interlocking plants; and as the science of electricity is constantly advancing it will not be strange if the signaling field shall continue to witness important changes for some years to come. Moreover, the rapid progress which we see in all the arts of the working world affects this, as well as every other field of industrial activity; for the merits of rival signal apparatus are in some cases so hard to differentiate and compare that the prosaic question of cost is the decisive factor; and cost depends upon a great many considerations besides those based on electrical or mechanical science. I shall therefore be satisfied if I can leave on your minds a few definite impressions which may aid you in comparing, each for himself, the merits of the respective devices claiming your attention.

As far as the interlocking is concerned I need say only a word. All of the systems mentioned do satisfactory work, and on the records of the plants which are in operation the makers secure orders for new plants at other places. Power interlocking is now a necessity in the largest and most crowded yards, and is being simplified so that it is economical in smaller yards than formerly. Ordinary manual mechanical interlocking is a field in which there is marked progress. This does not come under the head of new devices, but it should be mentioned as an important feature of American railroad practice at the present day. To cite only one illustration, the introduction of simple interlocking at the very numerous crossings of the through lines between the Allegheny mountains and the Mississippi River, has, by obviating the necessity of stopping trains, saved from 30 to 90 minutes of the time of through expresses and, no doubt, has prevented innumerable break-in-twos of freight trains.

Manual Block Signaling.

And first, it must not be forgotten that numerous instances of the most commendable progress in signaling have no connection with ingenious mechanical devices or labor saving inventions, so that it would be impossible to throw anything like glamour around a description of what has been done in such cases; and yet this branch of the subject must not be slighted. I refer to the cases of roads in the West and South where traffic is light and earnings are small, and costly appliances cannot be indulged in. The essence of the block system is found in any device which will maintain an interval of space between trains; and as the most primitive prairie telegraph office affords the means of doing this, the manager of a road in such a country, who feels the need of better safeguards against collisions, has it in his power to adopt this safeguard at any time when he feels warranted in making the necessary expenditures; which usually means perhaps 25 per cent. more telegraph operators and $50 to $100 expenditure at some of the stations for additional apparatus. I am speaking now of the most frugally equipped railroad. Those doing more business would spend more. They would lengthen and rearrange sidetracks, would put in more extensive signals, string an additional telegraph wire, and perhaps add new telegraph stations, so as to make the block sections shorter and of uniform length.

I have in mind a road in the West where, without any track circuits or electric locks, or power apparatus of any kind—nothing automatic and nothing but the telegraph and the simplest form of signal—the movement of trains is managed most admirably. The plan has been changed from the former uncertain one, dependent for safety on flagging rules that were hard to enforce, and on a very high degree of vigilance in scores of men, with whom it was difficult to maintain efficient discipline, to an almost ideal one. This road brings to Chicago sometimes on a single morning 25 or 30 trains of live stock, and these trains have to be run at 25 miles an hour and faster. At the hour when the first train reaches Chicago the others will be found by the despatcher's sheet to be strung along for 150 to 200 miles, one train in each and every block section, except that occasionally one block section will have a passenger train instead of a freight. The whole road is full of trains, and every one of them is protected against rear end collisions in a manner which has proved effective (in England) for 40 years; and all at the least possible cost for signaling. The block sections are three or four miles long, and, it is true, the road is not packed full of trains as is a city electric railroad or as would be the case with freights on a busy railroad working under the old rule, which says keep five minutes apart except at meeting and passing places; but, on the other hand, experience has shown that unless a road has unlimited territory at its terminals, there is no benefit in packing trains together as closely as they can be run. The exception in the time interval rule just quoted is availed of by enginemen not so much to really facilitate business as to further their schemes for getting ahead of some other fellow. Whatever the purpose, the shortening of the time interval, whether approved by the Superintendent, or merely

*Extracts from a paper read before the New England Railroad Club at Boston, May 14, by B. B. Adams, Associate Editor of the *Railroad Gazette*.

winked at, or entirely ignored, is what has caused numberless collisions and made clear the necessity for using the space interval.

And the strong feature of this example is the absence of permissive blocking. When the block system was first thought of for roads in thinly settled territory like our Western States, roads made up almost wholly of single track lines, the protection of passenger trains was the main feature. On many miles of such road to-day, the rules require the protection of passenger trains only. The idea was, even if the block signals were used for freights, the permissive system was to be freely employed; it was believed to be necessary to do so. That is, if two freights were ready to leave a yard within five minutes of one another and the block sections were so long as to necessitate an interval of 10 or 15 minutes, the block system was to be suspended for the time being. It was deemed necessary to do this to avoid annoyance and perhaps extra work in the yard. But persistent superintendents, determined to get the utmost possible benefit out of the block system, have found that these annoyances and the supposed extra work are not insurmountable difficulties. The yardmasters and trainmen complained a little, but they were compelled to adjust their work to the new plan and, now, they have become accustomed to it and get along without any trouble. The superintendent of the road just mentioned tells me that permissive signaling is very rare on his lines. Only to accommodate work trains and local freights which are necessarily detained at irregular places are permissive signals allowed.

The block system, worked by station operators, as in this case, furnishes, on single track lines, a substitute for repetition in the transmission of despatchers' orders. A train despatcher stated recently that the average detention of trains, on his division, for delivering telegraphic orders to conductors and enginemen was seven minutes for each order. This might easily average an hour a trip on a 150-mile road. But this seemingly wasteful use of time is made necessary by the great care required to avoid mistakes. A little mistake may cause a disastrous collision. But with collisions already guarded against by the block signals at each station, these block signals affording all necessary protection against butting collisions as well as against those between trains running in the same direction, the despatchers' orders may be as brief and informal as though the despatcher were on each train himself giving his orders orally. His only function as regards the trains is to see that those of inferior classes do not obstruct or detain the superior trains. If trains were all of the same class and of equal importance he could leave the whole movement to the operators at the stations. Where trains from opposite directions desired to enter a block section at the same time the operator would, of course, have to decide which of the two should have the preference; but if the needs of the business did not require a preference to be given to any particular train the operator could, of course, use his own best judgment without consulting the despatcher.

The despatcher being relieved of all responsibility for safety, he can issue his orders to station operators with as little formality as though he were a tallyman in a freight house giving orders to truckmen. It is true that this labor-saving and time-saving innovation has not yet been adopted to any extent in this country, but this is due largely to pure inertia or conservatism on the part of the officers of the railroads. A bright-minded superintendent managing an important division of a prominent railroad tells me that he is ready, whenever his superiors will give the word, to abolish both the repetition of train orders and the sending back of flags from delayed trains. Both of these expedients should be entirely unnecessary where the block system is in use and suitably administered. And why not? If block signaling practice agrees with its theory, it is a perfect protection against *rear* collisions, and we have the experience of 40 years to confirm the conclusion. But the *way* it prevents collisions is by giving train A absolute and positive information that train B is *not* on a certain stretch of track; and it is too clear to need to be stated, that this same process can be applied as well to opposing as to following trains.

Everyone who knows anything about the work, the care and the anxiety of a despatcher's office on a busy single-track railroad will appreciate the value of the block system for the conditions here considered.

The manual block system is seen in its perfected form on the Providence Division of the New York, New Haven & Hartford. (The Coleman machine.) Apparatus of this type is used throughout the main line of the New Haven road from Boston to Woodlawn, New York City. By means of the elaborate machinery here provided every possible mechanical safeguard is thrown around the processes which have to be carried out by the operators. This invention has been developed under practice with all sorts of adverse conditions. Operators have been found to be not only subject to the ordinary infirmities of memory and to unexpected mental dulness, but to laziness which would lead them to try to "beat the machine"; and to defective consciences which would lead them to exercise great ingenuity in inventing tricks, when awake, to avoid the performance of duty when tired and sleepy. But Messrs. Sykes, Patenall, Coleman and the other experts who have improved this device have perfected it so that it is equal to every emergency; and the operator who sets out to risk the lives of trainmen and passengers must not only violate his conscience, even if it be a very dull one; but must always get a fellow operator, at the other station, to do the same. And he must take a good deal of pains in carrying out his scheme. For a manual system controlled by electrical checks it is difficult to see how any one can ask for more than is now provided. In England, where automatic signaling has not yet gained a foothold, instruments of this type are now being used on a number of roads. Mr. Sykes offered his invention to the English roads 20 years ago, but only a very few adopted it until within the last few years.

(To be Concluded.)

TECHNICAL.

Manufacturing and Business.

George Westinghouse, Jr., heretofore Vice-President of the British Westinghouse Electric & Mfg. Co., has been elected President.

The South Indian Railway, it is reported, through its London office, 55 Gracechurch street, will soon receive bids for the following: Rails, 41¼-lb., 991 tons, and fish-plates and other track material.

The contract for covering at the U. S. Immigrant Station, Ellis Island, New York harbor, has been awarded to the H. W. Johns Manufacturing Co., 100 William street, New York city. This contract amounts to $6,666.

Charles H. Taylor, New York, has resigned as Eastern Sales Agent of the Thornburgh Coupler Attachments Co., Ltd., Detroit, Mich., and until further notice all Eastern business should be transacted direct with the Detroit office.

Prof. Walter L. Webb, of the University of Pennsylvania, has opened an office as Consulting Engineer in the Harrison Building, Philadelphia, Pa. He is prepared especially for surveys, designs and estimates for trolley work, but will undertake general consulting engineering work.

The Falls Hollow Staybolt Co., Cuyahoga Falls, Ohio, manufacturers of both hollow and solid staybolt iron especially adapted to locomotive boilers, announces the following appointments: John Napier Dyer, Chicago agent, office 1425 Monadnock Block, Chicago; Thomas J. Noonan, Northwestern Agent, 923 Guaranty Building, Minneapolis, Minn.

Iron and Steel.

The stockholders of the Cambria Steel Co. have voted to sell their property to the recently formed Conemaugh Steel Co.

Last week the American Sheet Steel Co. announced a reduction of from $2 to $5 a ton in the price of black and galvanized sheets.

E. R. Dick has been succeeded by George S. Graham as President of the Cuba Steel Co., which is now owned by the Pennsylvania Steel Co., a Pennsylvania R. R. property.

John McConnell, of Coatesville, Pa., has been appointed Superintendent of the Ensley Steel Department of the Alabama Steel & Ship Building Co., succeeding W. R. Palmer, resigned.

The Pittsburgh Steel Co. has been incorporated in Pennsylvania by Wallace H. Rowe and others of Pittsburgh. The company will build a steel plant at Monessen at a cost of about $2,000,000.

Wm. G. Park, the former Chairman of the Executive Committee of the Crucible Steel Co. of America, and who resigned from that position early this year, has now resigned as a director of the company.

The Central Iron & Steel Co., of Harrisburg, Pa., is about to increase its capital stock from $1,000,000 to $5,000,000. The proceeds of the new issue, it is understood, are to be applied chiefly to extensions to the present plant.

The American Bridge Co. is building a double-track bridge over the Delaware River between Phillipsburg, N. J., and Easton, Pa., for the Lehigh Valley R. R., and remodeling the old bridge into a single-track structure. The entire work, when finished, will give the railroad three tracks instead of two, as at present.

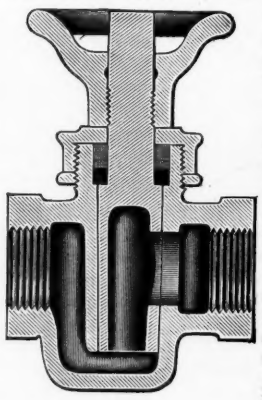
The following officers have been elected for both the National Steel Co. and the American Steel Hoop Co., which are merged into the Carnegie Co.: President, W. E. Corey; First Vice-President, H. P. Bope; Second Vice-President, W. W. Blackburn; Secretary, W. W. Blackburn; Treasurer, W. C. McCausland; General Manager of Sales, Henry P. Bope; General Agent, J. P. Kessler, Jr.; Ore Supply Agent, D. G. Kerr. All are officials also of the Carnegie Co. The general offices of both companies have been transferred from New York to the Carnegie Co.'s office in Pittsburgh.

The Cramp Steel Co., Ltd., incorporated under the laws of the Province of Ontario, Canada, is offering for sale $1,000,000 7 per cent. cumulative preferred stock, the proceeds of which will be used for completing the blast and steel furnaces and rolling mills at Collingwood, Ont., and to further equip the iron and coal properties of the company. The directors are: William M. Cramp, late General Manager Cramp Shipbuilding & Engine Co., Philadelphia, Pa.; Dr. W. Seward Webb, New York; Chas. D. Cramp, Philadelphia, Pa.; Col. A. B. Chandler, New York; H. L. Burrage, Boston, Mass.; J. Wesley Allison, U. S. Representative of Canadian Railways, New York; Hon. Sir Charles H. Tupper, Victoria, B. C.; Hon. Senator J. R. Gowan, Barrie, Ont.; A. McLean MacDonnell, Toronto, Ont.; J. A. Currie, Toronto, Ont.

The United Engineering & Foundry Co. of Pittsburgh has been incorporated under the laws of Pennsylvania, with a capital stock of $5,500,000. It includes the Frank-Kneeland Machine Co., Lincoln Foundry Co. and McGill & Co., of Pittsburgh, and the Lloyd-Booth Co., of Youngstown, Ohio. Of the stock, $2,500,000 is 7 per cent. cumulative preferred, and $3,000,000 common. Of the preferred and common stocks $1,000,000 each remains unissued in the treasury for the purpose of acquiring other plants in the future. Officers have been elected as follows: President, I. W. Frank; First Vice-President, Charles H. Booth; Second Vice-President, F. G. Campbell; Treasurer, Edward Kneeland; Secretary, J. E. Satler. The Board of Directors is composed of I. W. Frank, Otis H. Childs, Thos. J. Bray, Lloyd Booth, Edward Kneeland, Charles H. Booth, F. A. Campbell, James J. Donnell, James H .Lockhart, Richard Garlich, W. L. Abbott and J. E. Satler. Headquarters have been established at the plant of the Frank-Kneeland Machine Co., at Pittsburgh.

The Bordo Plug Valve.

This valve, as here illustrated, is made by the Bordo Valve Co., Coatesville, Pa. Blow-off valves and valves for high pressure steam service have all working parts made of brass, to give equal expansion throughout. A packing ring rests on the plug, which is compressed to the wall of the body by a brass wearing ring and gland. The plug, packing, brass wearing ring and gland are all held in position by the bonnet, which in turn is held in position by a lock nut. The threaded stem on the plug and a correspondingly threaded wheel, lightly adjusted to the bonnet and held in place by a set screw, prevent jamming. The operator is at all times in a position to regulate the plug for any desired pressure.



Slid Wheels.

At the April meeting of the Central Railway Club the following question was up for topical discussion: "When two wheels on the same axle are brake-slid, one wheel slid, say, 3 in. and the other wheel slid, say, only 2 in., should not both wheels be condemned?" After a spirited discussion, wherein several members stood against the assertion of one member, that it would be just to remove and charge for the wheel having 2-in. flat, it was declared the sense of the club that the M. C. B. limitation of 2½ in. slid wheel governs such cases.

National Bureau of Standards.

The law establishing the National Bureau of Standards, which has been described at length in this column, provides for a Board of Visitors to the Bureau. In accordance with this provision the Secretary of the Treasury has appointed the following Board, and all the members have accepted: Dr. Ira Remsen, President of Johns Hopkins University; Dr. Henry S. Pritchett, President of the Massachusetts Institute of Technology; Prof. Elihu Thomson, Electrical Engineer; Dr. Edward L. Nichols, Professor of Physics, Cornell University, and Mr. Albert Ladd Colby, Metallurgical Engineer of the Bethlehem Steel Co. The Board is a strong one and the interests of the Bureau will be well served. Another appointment to the Bureau just announced is that of Prof. Edward Bennett Rosa, who has been made Physicist on the working staff of the Bureau. Prof. Rosa was born in New York State in 1861. In 1891 he graduated from Johns Hopkins University with the degree of B. S. in Physics, and has been Professor of Physics at Wesleyan University, Middletown, Conn.

Robins Belt Conveyor Patents Sustained.

The suit of the Robins Conveying Belt Company of New York against Exeter Machine Works, argued last October before Judge Wheeler in the United States Circuit Court at New York, appears to have been settled. The Robins Company complained that the Exeter Works had advertised and in two instances had sold belt conveyor apparatus which infringed Patents 499,472, June 13, 1893, and 571,604, Nov. 17, 1896, both owned by the Robins Company. Judge Wheeler issued on Nov. 15 an interlocutory decree and injunction against the Exeter Works, establishing the patents and forbidding the use or advertising of the apparatus covered by them. An accounting was ordered before Special Master John M. Shields. His report (March 6) awarded damages to the Robins Conveying Belt Company, which have since been paid.

THE SCRAP HEAP.

Notes.

The police of Washington, D. C., have discovered that counterfeit tickets used on the street railroads of that city for many months past were printed in Scotland. After much searching it was found that the tickets were sold by or through a conductor named Ingley; and it turned out that a brother of this conductor went to Europe several times to get the tickets. He had them reshipped several times from one city to another, and made his journeys on cattle steamers so as to escape observation.

The Railroad Commissioners of Massachusetts now

have the same power of investigation and recommendation concerning fares on street railroads as on standard railroads, the restrictions formerly existing having been removed by the Legislature of this year. The Commission has already considered two applications for reduction in fares. That from Rockland was denied; the petition from the Selectmen of Stoughton for a reduction of fares to Brockton is approved. Heretofore the fare between these towns has been 10 cents (ordinary) with workingmen's tickets, good morning and evening, at the rate of seven for half a dollar. The Commission recommends that the latter rate be extended throughout the day, and that the workingman's tickets be sold at the rate of 10 for half a dollar.

Traffic Notes.

The railroads of the State of Washington have agreed to charge demurrage on freight cars at all stations, the rate being $1 a day after 48 hours.

The United States Court at Little Rock has issued a perpetual injunction against the Railroad Commissioners of Arkansas restraining them from enforcing orders requiring railroads to make joint through rates according to the Commissioners' tariff.

There are now about 40 ticket brokers' offices in Buffalo, an increase of 15 since the first of June; and it is said that most of the tickets which they deal in are of the ironclad signature form. They are reported to be doing a large business in $9 tickets from New York and cities near New York to Buffalo and return.

The New York Central and the Pennsylvania have this week taken large excursions from New York and other Eastern cities to California. That by the Pennsylvania, which included parties going to the National Convention of the Epworth League, at San Francisco, occupied four trains, the total number of passengers after leaving Pittsburgh being about 400.

The first definite news of a change in the traffic field in consequence of the affiliation of the Union and the Southern Pacific roads appears in an item in the San Francisco *Chronicle* of June 23 to the effect that the Oregon Railroad & Navigation Company, which has solicited soldier traffic at The Presidio, and has succeeded in taking 20 per cent. of the business, will hereafter make a less strenuous fight for the business.

Chicago reporters continue to find what they call troublesome rate cutting on freight eastbound from that city; and they say that the trouble is aggravated by the fact that no statistics of eastbound shipments are published. It is claimed by some of the railroad men that when the aggregate amounts of the shipments by the several roads were made public every week the tricks of the weaker roads were more quickly discovered.

On Saturday last the Atchison, Topeka & Santa Fe announced that, in consequence of extensive secret rate cutting by its competitors, it would, on July 15, make a general and sweeping reduction in freight rates from Chicago to the Missouri River, the figures in the notice showing cuts of from 20 to 60 per cent. This announcement immediately caused much discussion, some traffic men asserting that this move was the culmination of rate disturbances which have been going on all the time for nearly a year; that is, since a few weeks after the agreement of July 1, 1900, when the Presidents west of Chicago established district committees at Kansas City, Omaha, St. Paul, etc., to regulate freight rates. As is well known, most of those committees were never organized. At this writing it does not appear certain that the Atchison's reduction of July 15 will be put into effect. On Tuesday it was said that the Presidents of the several lines had reached an agreement which would induce the Atchison to withdraw its notice. The announcement, however, is accompanied by statements about a "plan for an equitable diversion of traffic" which throws some doubt on the authenticity of the information about the alleged "agreement."

The Manning Convertible Car.

The Manning convertible box car of the Baltimore & Ohio Railroad has been so recently described and so fully described in the *Railroad Gazette* that the reader will remember its characteristics. This car recently arrived at elevator C at Locust Point direct from Fairport, Ohio, loaded with 1,500 bushels of corn. The hopper bottoms of the car were opened and the grain dropped into the elevator hopper without shoveling. Immediately after unloading it was converted into an ordinary box car to be reloaded with merchandise.

Its first trip was made in April with a load of coal from Fairmount to Baltimore. This was unloaded by dumping, which took 20 seconds. The car was then converted into a flat bottom box car and sent to Chicago with a load of bucket oysters attached to a passenger train. It then returned with grain to Baltimore as a flat bottom box car, and was unloaded by steam shovels. Next it took a load of coal to the Lakes and returned loaded with grain in form to dump through the hoppers, as said above. It will be seen that the car is adapted to a considerable range of service, and it is probably the only hopper bottom box car.

Equipment for the Cape.

Mr. C. B. Elliott, retiring General Manager of the Cape Government Railways, has been appointed Special Commissioner for the Cape Railway system, with authority to visit England, the Continent of Europe and America, and to place orders for the new equipment required for the great development of the Cape traffic which is expected when peace is re-established in South Africa.

Electric Railroad Crossings in Michigan.

The Supreme Court of Michigan has sustained the law which empowered the Railroad Commissioner of the State to prescribe safeguards at crossings of electric and steam railroads and to apportion the expense of providing them. This decision was in the case of the Detroit, Fort Wayne & Belle Isle Ry. Co. vs. the Commissioner of Railroads. An order was made by the Commissioner for safety gates at the Clark avenue crossing of the tracks of the Union Terminal Association in the city of Detroit and for derailers in the tracks of the street railroad company, such gates and derailers to be operated by a watchman from a tower, and the expense of construction, maintenance and operation to be equally divided between the two companies. It appears that the Union (steam) line was the last one built, and on this the electric line claimed that it could not be required to pay any part of the expense, but the Court holds that the statute applies to the case. It makes it the duty of the Commissioner to order such changes in the manner of crossings, or such safeguards for the protection of the public thereat as in his judgment shall appear to be necessary, and to apportion any expense incident thereto, between the companies affected, as he may deem just and reasonable; and the Court holds that this was a valid enactment; that such discretionary powers might properly be vested in the Commissioner by the Legislature.

A number of other orders involving the same question, thus far un-enforced, pending the decision in this case, will now be taken up and forced to a conclusion.

Massachusetts Grade-Crossing Funds.

The Treasurer of Massachusetts, by the advice of the Governor and Executive Council, has placed in the grade crossings loan sinking fund the $5,000,000 Boston & Maine 3 per cent. bonds received for the common stock of the Fitchburg Railroad sold by the Commonwealth to the B. & M. last year. The income from these bonds has heretofore been put into the state school fund, but from July 1 it will go into the grade crossings loan sinking fund, so that hereafter this fund will take care of itself, without taxation. The total amount thus far raised for crossings is $8,000,000, five millions having been authorized by Chap. 428, Acts of 1890, and three millions by special legislation, for the purpose of eliminating crossings in Roxbury and Hyde Park on the Providence Division of the New Haven road. The first-named sum matures in 1923, and the three millions in 1928 and 1929. As before reported, this money is now all spent, or is so nearly used up that further appropriations are being held in abeyance. There is said to be little doubt that the next session of the Legislature will, on the recommendation of the Governor, authorize a new grade-crossings separation loan, and that it will be issued under a new law, which will provide that the street railroad companies shall share in the expense of the eliminations. This new law will probably provide that the sum to be paid by the street railroad shall be determined by the special Grade Crossing Commission in each case, and be deducted from the entire expense, before the remainder of the expense is apportioned between the standard railroad, the town and the state.

British Locomotives for Burmah.

British locomotive builders have taken a contract for 30 locomotives for the railroads of Burmah. Cable despatches say that their bids were more favorable than those of the Americans as to price and as to time of delivery.

The Torpedo Boat "Biddle."

The torpedo boat "Biddle," built by the Bath Iron Works, recently made an average of 28½ knots for two hours, or ½ knot more than required by the contract. The "Biddle" has twin screws, 4,200 i.h.p. and 167 tons displacement.

American Locomotive Company.

The details of the application to have the stock of the American Locomotive Company admitted to dealings in the unlisted department of the New York Stock Exchange were made public Monday. The application states among other things that of the $50,000,000 capital stock, divided equally between common and 7 per cent. cumulative preferred, 900,000 of preferred stock is unissued, being held in the company's treasury for general purposes. The company has no bonded debt, and may not mortgage its property except for purchase money mortgage except upon the assent of holders of two-thirds of the preferred stock. There is a bonded debt upon constituent companies as follows: Dickson Manufacturing Company, Scranton, Pa., $562,500 5 per cent. bonds, maturing Nov. 1, 1927; Richmond Locomotive Works, Richmond, Va., $750,000 5 per cent. bonds maturing April 1, 1929. The American Locomotive Company owns in fee the Dickson Company and the following other concerns: Brooks Locomotive Works, Dunkirk, N. Y.; Cooke Locomotive & Machine Company, Paterson, N. J.; Pittsburgh Locomotive & Car Works, Pittsburgh, Pa.; Rhode Island Locomotive Works, Providence, R. I., and the Schenectady Locomotive Works, Schenectady, N. Y. The company also owns 18,850 shares out of a total of 18,890 shares of the Richmond Locomotive Works, and 3,000 shares, being the total capital stock, of the Manchester Locomotive Works of Manchester, N. H.

Tunnel Accident at Baltimore.

On the night of June 28 a portion of the roof of the tunnel of the Philadelphia, Wilmington & Baltimore Railroad at Central avenue and Hoffman street, Baltimore, fell upon the track below and derailed a train, and two of the express cars in the train were buried by the mass of earth which fell upon them. No person was seriously hurt, but the road was blocked for ten days. The train which was derailed was the second section of No. 78, eastbound, and the time was about 2 o'clock in the morning. The mass of earth above the roof of the tunnel is about 42 ft. deep. The cause of the failure has not been clearly decided. Water from a street main ran down with the sand, but there appears to be no evidence that the water caused the rupture. There is some quicksand near the tunnel and some timbers above the brick-arch roof were found very rotten. The clearing of the tunnel involved digging down from the street above, an opening about 60 ft. square being made. The work of getting out the derailed cars and the rubbish which covered the track was very troublesome and severe. The temperature where the men worked was 130 degrees, and gas from broken pipes frequently compelled them to go out for air every 15 minutes.

During the blockade trains were run through the city over the Baltimore & Ohio. The Mount Royal station of that road is not far from the P., W. & B. station. Replying to questions of reporters, President Loree, of the B. & O., said that this use of the B. & O. line by the Pennsylvania trains might be made permanent if the people of the city so desired.

Sixteen Passengers Killed on the Wabash.

On the morning of June 26, about 1 o'clock, westbound passenger train No. 3 of the Wabash road was derailed at a washout at Cass, Ind., wrecking the engine and five cars and causing the death of 16 passengers. Twenty-six passengers and two employees were injured. The first newspaper accounts stated that the train broke through a bridge which had been undermined by a freshet, but this appears to have been incorrect. A statement published as coming from Mr. Joseph Ramsey, Jr., President of the road, says:

"The accident to Train No. 3 on the night of June 25 was not one which could have been guarded against. The accident did not occur on a bridge or trestle, but at a point where there has been a solid embankment for the last forty years. There is a small stream at this point, which has always been easily taken care of by a 3-ft. stone culvert, and there has never been any high water at this point. Just before the accident two heavy clouds were noticed approaching each other some distance north of our line, but as this occurred late at night there is no definite information as to what really did occur.

"It is supposed that when these two clouds came together there was a very heavy downpour of rain at the head of the small valley over which our embankment passed. The water rose some 5 or 6 ft. above the top of our culvert, and, passing down through the culvert, caused a sort of a whirlpool action which cut into the bank on the north side and undermined the north half of the track, so that when the engine came on it was thrown to the north, and the cars went down the south bank. The culvert was not washed out, and neither was the embankment completely destroyed."

Through the Canals at Sault Ste. Marie, June, 1901.

East Bound.	
Grain, bushels	1,667,757
Building stone, net tons	6,214
Flour, barrels	955,768
Iron ore, net tons	3,161,982
Wheat, bushels	3,421,802
Passengers, number	3,582
West Bound.	
Coal, hard, net tons	89,655
Coal, soft, net tons	622,325
Salt, barrels	73,405
General merchandise, net tons	76,168
Passengers, number	3,586
Total freight, net tons	4,519,075
Vessel passages, number	3,197
Registered tonnage, net tons	3,975,392

Speed Limit for Automobiles.

Three of the Swiss cantons have solved the question of the limitation of the speed of automobiles in a radical way. No automobile shall be permitted on any road in the canton.

The Congo Railroad.

The Congo Railroad has become so profitable that a reduction of the rates one-half, without any increase in traffic, would leave enough for full dividends. It should be remembered, however, that the present rates are simply monstrous, if compared with those in civilized countries, but are still for such a freight as ivory no check on the traffic and much less than the cost of any other available means of transportation. The road is now 241 miles long, but it gives an outlet for thousands of miles of navigable waters of the upper Congo and its tributaries. The Belgian Government has the right to take over the road at a fixed price, which is about double the face of the shares; or it can immediately reduce the rates, in which case it must postpone the purchase of the railroad.

An Alcohol Locomotive.

On a private railroad used chiefly to carry coal to and bricks from a brick yard in Prussia a locomotive using alcohol as fuel is used. It was built for a society for the promotion of the use of spirits, which, in that part of the world, are largely produced in distilleries of large landholders, to utilize syrup produced in making beet sugar, unmarketable potatoes, etc. Those who get their idea of the cost of alcohol from the market quotations for whisky should bear in mind that something like four-fifths of that price is government tax. In Germany, the need of a market for spirits has been so felt that extensive experiments have been made with it as an illuminant, with something like a Welsbach burner, and with some success, directly in the face of petroleum.

A Gold Coast Railroad.

The English are building a railroad in the African Gold Coast colony from the sea at Sekondi inland towards Coomassie, and have laid 39½ miles of track, to Tarkwa. One of the difficulties in holding these African tropical colonies is to keep the troops alive long enough to get over the lowlands near the coast. If they must march, as in the Ashantee campaign, in this same country, a good part are dead with fever before the uplands are reached, and many more disabled for a long time. With a railroad, they may be expected to go too fast for the fever to catch many of them.

A New Railroad Into Turkestan.

Surveys are making and an appropriation of $4,500,000 has been made for beginning work at both ends on the proposed railroad from Orenburg, near the line between Europe and Asia, at the terminus of a railroad some time in operation, southeast to Tashkend, about a thousand miles in an air line. In its northern half the line is through a grazing country, and then it follows the river Syr Darya (the ancient Jaxartes), where cotton is grown in quantity, and the country, where irrigable, is very productive. This will connect the railroad system of European Russia with Turkestan and the Asiatic Midland (late Trans-Caspian) Railroad, which now is reached only by crossing the Caspian Sea. The line will thus have considerable strategical importance; but it probably is economically justifiable, though it is quite possible that it is premature to undertake it now.

The Helen Iron Mine.

The following paragraph from the report of Dr. Robert Bell, of the geological survey, gives some idea of the great body of iron ore that the new Helen mine represents. The mine is at Michipicoten, on the north shore of Lake Superior. "The existence of iron ore at what is now the Helen mine is said to have been known for two or three years to certain trappers and explorers, one of whom, Benjamin Boyer, brought it to the notice of Mr. F. H. Clergue in 1899. The latter purchased the location and immediately proceeded to develop it as a mine. The ore is a hard but somewhat porous or spongy red hematite, with a specific gravity of about five. Small quantities of brown hematite (limonite) and yellow ochre appear in joints and cavities, but they do not form any appreciable portion of the mass. The horizontal dimensions of the exposed ore are about 500 ft. in every direction, and its greatest height above the lake is 100 ft. The ground rises steeply all around the head of the lake, so that the ore lies at the bottom of the amphitheatre, open to the west or lake side. A drift has been run at the level of the general surface of the ore, southward into the hill, and this penetrates similar hematite for 250 ft., thus giving a known breadth of 750 ft. from north to south. During the winter of 1899-1900, by taking advantage of the ice on the lake, a number of holes were bored in the bottom along a north and south line, which passed the extremity of the point of the ore at a distance of 250 ft. to the westward. On this line and abreast of the point the lake had a depth of 100 ft., including 10 ft. of soft mud, and at 150 ft. below the bottom, where the boring ceased, the drill was still in hematite like that on the dry land. A bore-hole from the surface of the exposed ore was sunk to a depth of 188 ft. below the level of the lake without reaching the bottom of the hematite. The ore mass has a continuous depth of 300 ft., and as this follows the plane of the bedding, which is vertical, the probability is that the depth is very much greater."

CAR BUILDING.

The Southern is in the market for 100 box cars.

The Pennsylvania is reported in the market for freight cars.

The Canadian Pacific will build 300 box cars at its own shops.

The Erie is receiving bids on 1,000 steel coal cars of 100,000 lbs. capacity.

The American Car & Foundry Co. has received miscellaneous orders for 74 cars.

The Mexican Central is having 30 freight cars built by the Allison Mfg. Co.

The Ocilla & Irwinville is having one coach built by the American Car & Foundry Co.

The American Gas Co. has ordered three trolley cars from the American Car & Foundry Co.

The Macon, Dublin & Savannah has ordered 200 cars from the American Car & Foundry Co.

The St. Lawrence & Adirondack is having one coach built by the American Car & Foundry Co.

The Chesapeake & Ohio is having 300 freight cars built by the American Car & Foundry Co.

The Ivorydale & Mill Creek is having 25 freight cars built by the American Car & Foundry Co.

The American Cotton Oil Co. has ordered 100 tank cars from the American Car & Foundry Co.

The Mobile, Jackson & Kansas City has ordered eight cars for passenger service from Harlan & Hollingsworth.

The Illinois Central has ordered 500 box cars, of 80,000 lbs. capacity, from the American Car & Foundry Company.

The Cincinnati, Hamilton & Dayton has ordered 250 box cars from the Barney & Smith Car Co., and 250 from the American Car & Foundry Co., all of 80,000 lbs. capacity.

The New York Central & Hudson River order for 200 flat cars of 80,000 lbs. capacity with the Haskell & Barker Car Co., referred to June 21, calls for cars to measure 40 ft. long and to have Haskell & Barker bolsters, brake-beams and draft rigging, Westinghouse brakes, Gould couplers and malleable iron journal boxes and journal box lids.

LOCOMOTIVE BUILDING.

The Chicago Union Transfer Co. is in the market for six switching locomotives.

The Canadian Northern is having five engines built by the Baldwin Locomotive Works.

The Canadian Pacific is having four engines built by the Canadian Locomotive Works.

The Canadian Pacific is reported to have ordered eight engines from the Brooks Locomotive Works.

The Mexican Central has ordered 15 engines from the American Locomotive Co., to be built at Dunkirk.

The Terminal Railroad Association of St. Louis is having two engines built by the Baldwin Locomotive Works.

The Elgin, Joliet & Eastern has ordered 11 consolidation engines and two switchers from the Baldwin Locomotive Works.

BRIDGE BUILDING.

Albany, N. Y.—John N. Partridge, State Superintendent of Public Works, has asked State Engineer Edward A. Bond for plans and specifications for seven bridges, as follows: Cohoes, over Champlain Canal, 82 ft. span to cost $13,000; between Collins and Parysburg, over Cattaraugus Creek, to cost about $17,000; near Rexford Flats, over Erie Canal, to cost about $10,000; at Buffalo, over Clark & Skinner Canal, at Ohio street, to be 64 ft. span and cost about $25,000; at Buffalo, over Black Rock Harbor, at Ferry street, to be a swing bridge 132 ft. long and cost about $30,000; at Waterford, over Champlain Canal, to be 60-ft. span and cost about $10,000; at Rochester, over Erie Canal, to be 90-ft. span and cost about $50,000. The exact lengths are not yet fixed. The surveys are now being made and after the plans are made and approved the Superintendent will ask for bids.

Battleford, North West Territory.—Bids are wanted, July 19, for the superstructure of a bridge over Battle River. Fred Gelinas, Secretary, Department of Public Works, Ottawa, Ont.

Benwood, W. Va.—George W. Yost, Secretary of the Bellaire, Benwood & Wheeling Bridge Co., writes us that James H. McCrady, at Braddock, Pa., will want bids some time this month or in August for building the cantilever bridge proposed over the Ohio River between Bellaire and Benwood. It will be about 2,500 ft. long, and Albert Lucius, 38 Park Row, New York, will make the plans.

Berlin, Mich.—The Grand Rapids, Grand Haven & Muskegon Ry. has submitted plans to the Michigan Commissioner of Railroads for overhead crossings of the Detroit, Grand Haven & Milwaukee about two miles west of Berlin, and near Spring Lake. Both bridges will be 22 ft. high, the first being 24-ft. span and the other 38 ft.

Bloomsburg, Pa.—The Commissioners of Columbia County are considering building bridges over Little Fishing Creek and Musser's Run.

Boston, Mass.—The contract for building a Melan concrete steel arch bridge over Neponset River at Mattapan, Blue Hills Parkway, Boston and Milton, consisting of one span 50 ft., and two spans each 14 ft., 84 ft. wide, and a Melan arch culvert near by of 20 ft. span, 130 ft. wide, has been awarded to O'Hern & Berrigan, Yonkers, N. Y., at $44,300.

Chesley, Ont.—The question of building the Crispin bridge in Brant township is under consideration. Estimated cost, about $8,000.

Clay City, Ill.—We are told that the county is still considering a bridge over Little Wabash between Clay City and Noble. Nothing is decided. J. A. Bateman, County Clerk.

Cleveland, Ohio.—The Osborn Engineering Co. is reported making plans for the bridge needed by the Euclid & Wickliffe Plank Road Co.

Clinton, Ky.—There will be three steel bridges built in Hickman County this summer. E. B. Samuels, County Clerk.

Conneaut, Ohio.—George J. Hardway, according to report, has a franchise to build a high-level bridge over Conneaut Creek.

Denver, Colo.—The Department of Public Works is considering the viaduct proposed over West Colfax avenue, which will cost about $650,000. A branch viaduct has been talked of, to West Thirteenth avenue, at an additional cost of $85,000.

Ellicott City, Md.—The Howard County Commissioners have decided to build a new bridge over Hammonds Branch in the Sixth district.

Fairfield, Texas.—The County Commissioners, according to report, are receiving bids for three bridges.

Findlay, Ohio.—The Commissioners of Hancock County are considering building a steel bridge of two spans, 85 ft. each, over Blanchard River.

Galt, Ont.—The Council will raise $37,000 for a county bridge.

Glassport, Pa.—E. K. Morse, 904 Carnegie Building, Pittsburgh, has designed for the Glassport Bridge Co., a bridge over the Monongahela River at Port Vur and Drawsburg, Allegheny County. The channel span will be 520 ft., with side spans and about 2,000 ft. of approach for double-track trolley. Address John P. McIntyre, President, McKeesport, Pa.

Kinmount, Ont.—Steps will be taken immediately to build a steel bridge at this place, towards which the Ontario government has contributed $1,000.

Keosauqua, Iowa.—The County Supervisor at Winchester, Iowa, will soon receive bids for a steel bridge, about 200 ft. over Little Lick Creek.

Lima, Ohio.—The Lima, Delphos, Van Wert & Ft. Wayne Traction Co., we are told, will need some heavy bridging on its proposed road. (See Railroad Construction column.)

Lufkin, Texas.—We are told that the Lufkin Land & Lumber Co. will build a 200-ft. bridge over Angelina River also that the Central Coal & Coke Co., which is building a railroad from Lufkin to Crocket, will need a 300-ft. steel bridge over Neches River. Address the companies at Lufkin.

Martinsburg, W. Va.—We are told that John Grozinger, President of the County Court, is about to receive bids for a bridge over Dry Run at Kilmer's Mill.

Meaford, Ont.—The question of rebuilding the Trowbridge street bridge was considered at the last council meeting.

Missoula, Mont.—The Northern Pacific has under construction and contemplation 45 concrete piers covering foundation work for spans ranging from 30-ft. I beams to 200-ft. pin-connected spans, including 16 75-ft. plate girders and 20 concrete and masonry arches ranging in size from 4 ft. to 30 ft. in diam.

Norristown, Pa.—Sealed proposals will be received by the Commissioners of Montgomery County Aug. 7 for a steel and concrete highway bridge over Tacony Creek in Cheltenham Township, Montgomery County, also proposals will be received for a stone arch bridge on Belmont avenue, Lower Merion Township, Pa., near West Laural Hill. John Hampton, Chairman. John H. Dager, Engineer.

Pakenham, Ont.—Tenders will be received by James Connery, Township Clerk, up to July 26, for the superstructure for a bridge 232 ft. long, to be built over the Mississippi River at Pakenham Village. Plans at the office of Robert Surtees, C. E., 110 Wellington street, Ottawa, Ont.

Philadelphia, Pa.—The contract for the masonry of the two new Pennsylvania Railroad bridges over the Schuylkill is awarded to Drake & Stratton. The bridges, one on each side of the present structure, are to have three spans, and there will be three piers. Each is to be wide enough for two tracks. This masonry contract is to be completed by Jan. 1, 1902. The contract for the steel superstructure has not yet been awarded. (May 31, p. 372.)

Pickands Junction, Mich.—Plans have been submitted to the Commissioner of Railroads of Michigan by the Grand Rapids, Grand Haven & Muskegon for an overhead crossing of the Pere Marquette near Pickands Junction.

Pittsboro, N. C.—We are told that the county has several bridges to build, but nothing definite is decided. About 100 bridges are gone in the county.

Portland, Me.—The Grand Trunk, according to report, is considering building a new bridge over the tracks on Veranda street, East Deering, to allow of three tracks under the bridge, instead of two as at present.

Pueblo, Colo.—Four bridges on the Denver & Rio Grande, west of Pueblo, were destroyed by fire last week.

Red Lodge, Mont.—It is reported that bids are wanted, July 24, for some steel bridge work. W. F. Tinkcom, Chairman, County Commissioners.

Red Willow, Neb.—The County Commissioners want to know the cost of an iron or steel bridge about 100 ft. long, 14 ft. wide and about 8 ft. high over Republican River. R. A. Green, County Clerk, McCook, Neb.

St. Boniface, Man.—Engineer J. H. Hargrave estimates the cost of building a high-level steel bridge, with timber approaches, to replace present structure over Red River, between St. Boniface and Winnipeg, at $123,000. A by-law is before the Council. The Canadian Pacific has offered to build the approaches.

St. Catharines, Ont.—The Department of Public Works at Ottawa is receiving tenders for a bridge at Dunnville.

St. Cloud, Minn.—We are told that H. F. Meyer, Chairman of the County Board, Albany, Minn., will soon receive bids for two steel bridges, one of 126 ft. over Sauk River in St. Cloud and the other of 175 ft. in Melrose over Sauk River.

Smethport, Pa.—The Commissioners of McKean County are considering building a steel bridge of two spans, 115 ft. each, over Allegheny River, in Eldred township; also a steel bridge of two spans, 61 ft. each, over Potato Creek, in Keating township.

Strong, Kan.—We are told that bids will be wanted some time in August by W. A. Waddell, County Clerk at Cottonwood Falls, for a steel bridge of 180 ft. over Cottonwood River, about half mile west of the city.

Syracuse, N. Y.—Plans will soon be made for a plate girder lift bridge of 90 ft., over Oswego Canal at Butternut street. The state and the city will each pay part of the cost. H. T. Beach, Consulting Engineer.

Utica, N. Y.—The city has made an appropriation of $65,000 for building new bridges across the Mohawk River at Park avenue and at Genesee street. It is expected that the Council at its next meeting will order bids advertised.

Vernon, Texas.—The Blackwell, Enid & Southwestern, we are told, will need about three miles of bridging, most of which will be wooden trestles. A large bridge will be built over Pease River, 13 miles north of Vernon.

Washington, D. C.—Capt. Lansing H. Beach, Engineer Commissioner, District of Columbia, will receive bids about Aug. 1 for a concrete bridge over Rock Creek on the line of the Argyle Road. It will be about 150 ft. long and is estimated to cost about $150,000.

Capt. Beach will receive bids, about Sept. 1, for concrete work to the amount of about $75,000 on the bridge over Rock Creek on the line of Connecticut avenue, extended. This bridge will be 1,341 ft. long and the total cost will be about $1,000,000, of which $65,000 has been previously appropriated and covered by contract.

Wilkesbarre, Pa.—Bids are wanted, July 15, by A. E. Hess, Engineer Keystone Improvement Co., at Hazleton, for the steel bridges on the Wilkesbarre & Hazleton Ry. The bridges vary in length from 12 ft. to 160 ft. (July 5, p. 490.)

Williamstown, Ont.—C. H. McGillivray is receiving tenders for a bridge at McBain's Creek.

Yazoo City, Miss.—The Illinois Central contemplates building a bridge over Yazoo River about two miles from the city. It will probably be a drawbridge.

Other Structures.

Binghamton, N. Y.—According to local reports, the Delaware, Lackawanna & Western R. R. is laying out a site for the machine shops which will be transferred from Scranton, Pa. It is expected that the city will give the railroad about 70 acres of land free.

Boston, Mass.—The Warren Line pier 5, Hoosac Tunnel docks, in Charlestown, was destroyed by fire, on July 1, causing a building damage of about $50,000 and a stock damage of about $125,000.

Buffalo, N. Y.—The Lehigh Valley lost its freight house at Tifft Farm by fire, on June 27. It is said that the loss will reach nearly $100,000. The freight house cost about $36,000. A new station about 135 ft. wide by about 1,000 ft. long will be built.

Chicago, Ill.—The Chicago & Western Indiana is considering building a new station in place of the one at Polk and Dearborn streets.

Clarendon, Texas.—The Colorado Southern shops, including coaling station, water tanks and a large quantity of equipment, nine cars and five locomotives, were destroyed by fire at this place on July 5.

Columbus, Ga.—It is expected that the contract will soon be awarded for the new union station in Columbus, which is expected to cost $40,000.

Galveston, Texas.—According to report, the Southern Pacific will build a million bushel elevator on its reclaimed land at Galveston. Contractors are asked to submit bids.

Lansing, Mich.—It is reported that the Pere Marquette and the Michigan Central railroads have agreed upon a location for a joint passenger stone depot in Lansing.

Milwaukee, Wis.—The directors of the Allis-Chalmers Co. have voted $2,500,000 for building a new plant at Milwaukee, where the company has secured 100 acres of land. It is said that contracts for $500,000 worth of material have already been let.

Oklahoma City, Okla. T.—The Atchison, Topeka & Santa Fe, the Choctaw, Oklahoma & Gulf and the St. Louis & San Francisco are considering building a union station in Oklahoma City, where each at present have separate stations.

Salem, Ohio.—The stockholders of the Salem Iron Co. are considering increasing the capital stock to make extensive improvements to the plants.

San Antonio, Texas.—According to report engineers of the Southern Pacific have been considering a site for the new depot for that road on East Commerce street. The building will cost over $100,000. It will be used by both the Southern Pacific and the Missouri, Kansas & Texas roads.

Tampa, Fla.—The Tampa Bay & East Coast Ry., according to report, is preparing to build terminals at Port Tampa City. Vessels drawing 23 ft. of water will be able to load at the proposed docks.

Washington, D. C.—On July 13, the Commissioners of the District of Columbia will open bids for the machinery of the new sewerage pumping plant. Some of the bidders have asked for an extension of time for 30 days before the bids are opened, but an extension will probably not be granted.

The Navy Department is about to ask for bids for a ship fitter's shop and a metal worker's shop at the Boston Navy Yard, each building to cost $200,000. Bids will be opened about Aug. 1.

Wilmington, Del.—We are told that plans are being made at the office of the Mechanical Superintendent of the Pullman Company in Chicago, for rebuilding the shops in Wilmington. H. M. Pflager, Mechanical Superintendent.

MEETINGS AND ANNOUNCEMENTS.

(For dates of conventions and regular meetings of railroad associations and engineering societies see advertising page xvii.)

Central Railway Club.

There will be no meeting of the Club during the months of July and August. An effort is being made to have the Pan-American Exposition management name for "Railroad Day" the date of the next regular meeting of the Central Railway Club, which is Friday, Sept. 13. In event of its being done, early notice will be given to members.

The following committee has been appointed to report their interpretation of the revised rules of interchange to the September meeting: J. R. Petrie, East Buffalo, N. Y., Chairman; G. N. Dow, M. C. B., Lake Shore & Michigan Southern, Cleveland, Ohio; R. S. Miller, General Foreman Car Department, New York, Chicago & St. Louis R. R., Chicago, Ill.

Friday, Sept. 13, has been designated as Railroad Day at the Pan-American Exposition, Buffalo. The arrangements for the occasion having been entrusted to the Central Railway Club, President West has appointed the following committee to conduct the same: James Macbeth, M. M., N. Y. C. & H. R. R. R., Buffalo, Chairman; W. H. Marshall, S. M. P., L. S. & M. S., Cleveland; S. H. Jones, G. M., Magnus Metal Co.; O. P. Letchworth, Pratt & Letchworth Co., and Pemberton Smith, N. Y. Car Wheel Works, Buffalo. These gentlemen will seek the co-operation of committees from other railroad organizations in Buffalo and form a joint committee.

As the date named is the same as that of the next regular meeting of the Club, it is proposed to hold the Club meeting in the morning at the Hotel Iroquois instead of 2 p. m., reserving for the afternoon a brief programme of exercises in the Transportation Building at the Exposition grounds.

PERSONAL.

(For other personal mention see Elections and Appointments.)

—Mr. John M. Sherwood, Secretary and Assistant Treasurer of the Seaboard Air Line, died at his home in Portsmouth, Va., July 3, at the age of 43. He was at one time Treasurer of the Durham & Northern, also Secretary and Treasurer of the Georgia, Carolina & Northern. From 1893 to 1900 he was Auditor of Receipts of the Seaboard Air Line, and was appointed July 1, 1900, to the position he held at the time of his death.

—Mr. S. P. Howard, General Freight Agent of the Eastern and Lake Superior Divisions of the Canadian Pacific, is a native of Montreal, having been born there Dec. 30, 1865. His entire railroad career has been with the Canadian Pacific. He began in 1883 as a junior clerk in the freight department, then he became stenographer, and for one year (1887-1888) was a chief clerk. In 1888 he was appointed traveling freight agent, and four years later became city freight agent. Mr. Howard was Assistant General Freight Agent before his recent appointment.

—Mr. Nicholas D. Maher, the new General Superintendent of the Seaboard Air Line, was born April 29, 1854, at Blairsville, Pa. He was a student at the Mount St. Mary's College at Emmitsburg, Md., and entered railroad service in 1871 on surveys and construction for the Pittsburgh, Virginia & Charleston. He then became clerk in the office of the Superintendent of Transportation of the Pennsylvania, and in 1883 was appointed Chief Clerk to the General Manager of the Norfolk & Western. From this position he was promoted to be Trainmaster, and in 1890 he became Superintendent of the Pocahontas and Clinch Valley Divisions, which position Mr. Maher has just resigned to go with the Seaboard Air Line.

—Mr. Edward W. How, General Purchasing Agent of the Interoceanic Railway of Mexico, died recently from heart disease. He was born Oct. 20, 1852, at St. Louis, Mo., and was graduated from Washington University. He entered railroad service in 1870 as a clerk in the general freight office of the North Missouri, and held various positions on this road until 1873. In 1885 he was appointed Assistant General Freight Agent of the Southern Pacific Company (Atlantic System), and the following year was made General Freight and Passenger Agent of the Louisville, New Orleans & Texas. For two years (1890-1892) he was Traffic Manager of this company. Then for one year he was Chairman of the Mexican Traffic Association at the City of Mexico. Mr. How had been Purchasing Agent of the Interoceanic since 1898.

—Mr. Charles R. Fitch, whose jurisdiction as General Manager of the Erie Railroad has just been extended over the whole system, is 52 years old. He entered railroad service in 1866, and after occupying various subordinate positions was appointed Assistant Superintendent of the Long Island. In September, 1888, he became Superintendent of the Mahoning Division of the New York, Pennsylvania & Ohio. In November same year he was made Assistant Superintendent and Superintendent of Telegraph of the Long Island. From 1891 to 1892 Mr. Fitch was Superintendent of the Eastern Division of the New York, Lake Erie & Western and in November of the last named year (1892) he became General Superintendent of the same company, now the Erie. Mr. Fitch was appointed General Manager of the Erie on Jan. 8, 1900.

—Mr. Jacob S. Rogers, the principal owner of the Rogers Locomotive Works, at Paterson, died in New York city on the morning of July 2. His death was entirely unexpected, as he had not been really ill. He died in his room at the Union League Club, and was alone at the time. He was 78 years old, and had retired from regular business, but was still considerably occupied with the care of his property, and visited New York regularly every Monday morning. He was a very wealthy man and a bachelor. The recent history of the Rogers Works is familiär; that is to say, they were closed down some months ago, and since then the newspapers have had frequent accounts, more or less correct, about efforts to purchase them and to start them up again. These works have been famous for many years, and have turned out grand engines, which have gone all over the world.

—Mr. Geo. H. Shaw, Traffic Manager of the Canadian Northern, was born at Smiths Falls, Ontario, Nov. 25, 1859. Nearly all Mr. Shaw's railroad experience has been with the Canadian Pacific. His first employment was in the office of the General Passenger Agent of the Chicago, Milwaukee & St. Paul. This was in 1882. In August of that year he became Secretary to the Assistant Traffic Manager of the Canadian Pacific. In 1885 Mr. Shaw was appointed Chief Freight Clerk, and the following year he was put in charge of the passenger department. On completion of the lines through to the Pacific he continued to act as Chief Clerk of both the freight and passenger departments until the reorganization of the traffic department in 1899. Mr. Shaw was Assistant General Freight Agent of the Western Division before his recent appointment as Traffic Manager of the Canadian Northern.

—Mr. Wm. Cotter, recently appointed General Superintendent of the St. Louis, Iron Mountain & Southern, is a native of Bloomington, Ill., and is 43 years old. His first railroad experience was with the Chicago & Alton as night operator in 1873. He then went to the St. Louis, Iron Mountain & Southern, and was soon promoted to be train despatcher and later trainmaster. He left this company in 1882 to go to the Chicago, Milwaukee & St. Paul as train despatcher, and after remaining there one year took a similar position on the Wabash. The next year (1884) he was made Chief Train Despatcher. In July, 1896, he went to the Grand Trunk as Superintendent of the Eastern Division, and was transferred to the Western Division in 1899. Mr. Cotter reentered the service of the St. Louis, Iron Mountain & Southern as General Superintendent on June 1 last.

—Mr. H. E. Gilpin, who has just become Assistant General Manager of the Erie Railroad, in charge of the Ohio Division and the Chicago & Erie Railroad, was born near Philadelphia, Pa., in 1862, and entered the Auditor's office of the Philadelphia & Reading in 1880. In 1882 he became a rodman on the engineering staff of the Philadelphia & Reading, and was engaged in surveys and construction work for five years. His work included that of Assistant Engineer during the construction of the Shamokin, Sunbury & Lewisburg Railroad, which was the connecting link between the Philadelphia & Reading and the Fall Brook. He was also engaged on the surveys for the Baltimore & Ohio at Philadelphia. In 1887 he became Assistant Engineer of the Buffalo Division of the New York, Lake Erie & Western. Mr. Gilpin was, in 1892, appointed Superintendent of the Tioga Division of the Erie, and in November of the same year became Superintendent of the Allegheny Division. Mr. Gilpin received his new appointment July 1, 1901.

—Mr. Albert E. Mitchell, Mechanical Superintendent of the Erie Railroad, received the degree of Mechanical Engineer from the Maine State College, Orono, Me., 26 years ago. He entered the Baldwin Locomotive Works in 1876, and remained about a year. He began his railroad career in January, 1877, in the Altoona shops of the Pennsylvania, and in 1880 became Assistant Engineer of Signals. For one year (1881-1882) he was designer of hoisting machinery with the Yale & Towne Manufacturing Company of Stamford, Conn. He then re-entered railroad service on special duty in the motive power department of the New York & New England, and was for two years (1882-1884) Chief Draughtsman. Mr. Mitchell then became Mechanical Engineer for the French Furnace Company of Cleveland, Ohio, and Boston, Mass. In 1886 he assumed special duties in the motive power department of the New York, Lake Erie & Western, the following year becoming Engineer of Signals, then Engineer of Tests, and in 1890 Mechanical Engineer of this company and the Chicago & Erie. Mr. Mitchell was appointed Superintendent of Motive Power of the New York, Lake Erie & Western and its successor, the Erie, in 1892. The position of Superintendent of Motive Power of the Erie, formerly held by Mr. Mitchell, has been abolished.

ELECTIONS AND APPOINTMENTS.

Baltimore & Ohio.—W. S. Haines, heretofore Master Mechanic, has been appointed Assistant Mechanical Superintendent, succeeding the late Mr. Deibert. H. M. Bremen succeeds Mr. Haines at Newark, Ohio, as Master Mechanic.

Birmingham, Selma & New Orleans (Louisville & Nashville).—The officers of this company are: Vice-President, A. W. Graham; Secretary, J. H. Ellis; Treasurer, William H. Thompson; General Manager, G. E. Evans; Traffic Manager, C. B. Compton, and Comptroller, William J. Dickinson. Messrs. Graham, Ellis, Evans and Compton are officers of the L. & N.

Boston & Maine.—W. F. Ray has been appointed Assistant Division Superintendent, with headquarters at Springfield, Mass., succeeding H. F. Sampson, resigned.

Canada Atlantic.—W. P. Hinton has been appointed General Freight Agent. E. R. Bremner succeeds Mr. Hinton as Assistant General Freight Agent.

Chattanooga, Rome & Southern.—The Central of Georgia, having assumed control of this company, the President and Superintendent C. B. Wilburn will have charge of the road for the C. of G., as Superintendent, with headquarters at Rome, Ga. Mr. Wilburn's jurisdiction will also extend south to Griffin on the main line of the Central, taking in the main line between Carrollton and Griffin, about 65 miles.

Cincinnati & Muskingum Valley.—W. D. Wiggins, heretofore Assistant Engineer of the Pennsylvania Company (Southwest System), has been appointed Engineer Maintenance of Way of the C. & M. V.

Cleveland, Cincinnati, Chicago & St. Louis.—C. B. Kols has been appointed Acting Superintendent of Dining Car Service, succeeding John Egan, resigned.

Central of New Jersey.—W. C. Hope, for several years Chief Clerk, has been appointed Assistant General Passenger Agent, with headquarters New York City.

Denver & Rio Grande.—The jurisdiction of the following officers of the D. & R. G., has been extended over the Rio Grande Western: J. G. Metcalfe, General Manager; A. S. Hughes, General Traffic Manager; Fred Wild, Jr., General Freight Agent, and S. K. Hooper, General Passenger Agent. S. H. Babcock, heretofore Traffic Manager of the R. G. W., becomes Assistant General Traffic Manager, with jurisdiction over the D. & R. G., with headquarters at Salt Lake City, Utah. W. M. Lampton becomes Assistant General Freight Agent, at Denver, Colo.; S. V. Derrah, Assistant General Freight Agent, at Salt Lake City, Utah; T. E. Swann, Assistant General Passenger Agent, at Denver, and G. W. Heintz, Assistant General Passenger Agent, at Salt Lake City. The jurisdiction of Messrs. Lampton, Derrah, Swann and Heintz will extend over both companies.

Florida West Coast.—The officers of this company are: President, T. C. Talafero; Vice-President, W. R. Fuller, Jr.; Secretary and Treasurer, M. B. McFarlane and General Manager, R. C. Caples. The Directors, including those above mentioned, except Mr. Fuller, are: T. S. Hopkins, J. M. Thurston, G. W. Farris and A. H. Stewart. (See R. R. Construction column, June 7, p. 389.)

Grand Trunk.—C. S. Cunningham has been appointed Assistant Superintendent of the First, Second and Third Districts, with headquarters at Island Pond, Vt. A. S. Begg has been appointed Superintendent of the St. Clair Tunnel and Terminals, and will assume the duties of Agent at Port Huron Tunnel, succeeding Mr. Cunningham. R. P. Dalton becomes Assistant Superintendent of the Twenty-fifth District (Main Line Port Huron to Battle Creek), and the Twenty-sixth District, at Battle Creek, Mich.

Illinois Central.—On July 1, the divisions south of the Ohio River were reorganized as follows: The Tennessee Division will extend from Ballard Junction to the North Switch at Water Valley, Miss.; also from the South Switch at Paducah, Ky., to the North Switch of the North Yard at Memphis, Tenn., including the Troy and Dyersburg branches; in charge of W. S. King, as Superintendent, with headquarters at Fulton, Ky. The Mississippi Division will extend from the North Switch at Water Valley, Miss., to the North Switch at Canton, Miss.; and from the South Switch of the South Yard at Memphis, Tenn., to Grenada, Miss., including the Aberdeen and Winfield Districts; in charge of A. Philbrick, as Superintendent, at Water Valley, Miss. J. L. Downs has been appointed Supervisor of Trains and Track of the Springfield Division, with headquarters at Rantoul, Ill., succeeding E. Donoghue, retired.

On the same date the Yazoo & Mississippi Valley was reorganized, as follows: The Memphis Division will consist of the line between the South Yard at Memphis, Tenn., and the North Switch at Cleveland, Miss.; between Clarksdale, Miss., and the North Switch at Gwin, Miss.; between the junction switch at Gwin and Durant, Miss.; between Greenwood, Miss., and Grenada, Miss.; of the present Helena and Sunflower Districts; in charge of A. A. Sharp, as Superintendent at Memphis, Tenn., who will also have charge of the Memphis Terminals. The Vicksburg Division will consist of the line between the North Switch at Cleveland, Miss., and the North Switch at Vicksburg, Miss., together with the present Riverside, Leland and Kimball Lake Districts, and the Glen Allen Branch; in charge of J. B. Kemp, as Superintendent, at Greenville, Miss., and that portion of the Yazoo District between Jackson, Miss., and the North Switch at Gwin Yard, Miss., will be operated as a part of the Louisiana Division, Illinois Central, in charge of O. M. Dunn, as Superintendent, with headquarters at New Orleans, La.

Louisville & Atlantic.—A. T. Sabin has been appointed Chief Engineer, effective June 8.

Michigan Central.—H. D. Miles, Signal Engineer, has been promoted to the position of Assistant Superintendent of the Midland Division. The successor to Mr. Miles in the office of Signal Engineer is J. C. Mock, heretofore connected with the Union Switch & Signal Company.

New York, New Haven & Hartford.—G. T. Taylor, heretofore Assistant Division Superintendent, with headquarters at Taunton, Mass., has been appointed Division Superintendent at Boston, Mass., succeeding J. H. French. Edwin Milner was, on July 6, elected a Director.

It was announced at New Haven, July 9, that on July 15, the freight traffic department will be reorganized, the territorial division on a line passing through Willimantic and New London being abolished, so far as this department is concerned. Under the new organization the following officers will have jurisdiction throughout the company's lines, both rail and water: J. M. Williams, Freight Traffic Manager; F. S. Holbrook, General Freight Agent; G. L. Winlock, Assistant General Freight Agent, and W. F. Arnold, Freight Claim Agent. Mr. Holbrook's headquarters will be at New Haven; all of the others at Boston.

Northern Pacific.—T. Potter has been appointed Assistant to the President.

Pennsylvania Company.—H. E. Culbertson, heretofore Assistant Engineer of the Southwest System, with headquarters at Columbus, Ohio, has been transferred as Assistant Engineer at Pittsburgh, Pa., succeeding W. D. Wiggins.

Pere Marquette.—H. C. Potter, Jr., Comptroller, having resigned, that position has been abolished. J. E. Howard has been appointed Auditor. Thos. E. Borden becomes Cashier, and Fred H. Dean, Paymaster.

Shawnee, Oklahoma & Indian Territory.—P. L. Wise has been appointed Chief Engineer, with headquarters at Guthrie, Okla. T. (See R. R. Construction column, May 17, p. 342.)

Southern Pacific.—Press despatches from San Francisco, July 9, apparently authentic, state that J. A. Fillmore has resigned the position of Manager, and that his place will be taken by J. M. Herbert, who recently left the Missouri Pacific. The same despatch states that E. H. Fitzhugh, who recently left the Central Vermont to go to San Francisco, has been appointed Assistant to the President of the S. P.

Wheeling & Lake Erie.—E. W. Frink, Assistant Treasurer, has resigned.

RAILROAD CONSTRUCTION.

New Incorporations, Surveys, Etc.

ARKANSAS, MISSOURI & KANSAS.—This company was incorporated in Missouri July 8, with a capital stock of $2,000,000, to build from the south state line in Stone County, to the west state line in Jasper County, about 100 miles. The incorporators are: Albert N. Hoxie, H. Roby and D. W. Spooner, of Boston; Annie M. Johnson and Aravester L. Fuller, of Foxboro, Mass.; Henry Oleer and T. D. Northcutt, of Grangeville, Mo., and G. G. Farwell, of Joplin, Mo.

ATLANTIC & LAKE SUPERIOR.—The contract is reported let for an extension from New Carlisle, Que., to Paspebiac, four miles. (Construction Supplement, March 8, 1901.)

ATLANTA, KNOXVILLE & NORTHERN.—The company is reported contemplating extensive improvements at the mountain near Ducktown, Tenn.

BALTIMORE & OHIO.—An officer writes that nothing definite is decided as to the line from Lodi, Ohio, north to Lester. (July 5, p. 491.)

CAMMAL & BLACK FOREST.—Grading is reported begun on an extension from Pump Station, Pa., to Dodge Camp, 4½ miles.

CANADIAN PACIFIC.—Arrangements are reported being made by the Great Northwest Central for an extension to Noosemim, N. W. T., Sackatoon and the north.

CARROLLTON SHORT LINE.—An extension is proposed from Carrollton, Ala., to the Tombigbee River, 14 miles.

CATSKILL MOUNTAIN TRACTION (ELECTRIC).—This company was incorporated in New York July 3, with a capital stock of $300,000, to build a line 15 miles long connecting the cities named. The incorporators, all of New York City, are: Hawkins A. Tucker, Arthur E. Walradt, Gustave S. Dorwin, Robert E. McCormick, Joseph M. Keating, Chas. P. Blaney, Joseph Kelly, all of 52 Broadway; Herman F. Lee, 40 John street; G. Louis Meade, 26 Broadway.

CENTRAL COAL & COKE.—This company is building a railroad from Lufkin, Tex., to Crocket. (See the notice of the Kansas City Coal & Coke Co. under Texas Roads. Construction Supplement, March 8, 1901.)

CHIPPEWA RIVER & MENOMONIE.—Surveys are reported made for an extension from the present terminus to Bass Lake, Wis., three miles.

CHOCTAW, OKLAHOMA & GULF.—An officer writes that he knows nothing about any contemplated line from Amarillo, Tex., to Plainview, and has no reason to believe that such a line is contemplated. (June 28, p. 474.)

CLEVELAND, RICHFIELD & AKRON (ELECTRIC).—This company has been incorporated in Ohio to connect the cities named. Thomas L. Childs, of Akron, is an incorporator. The men interested are building the Canton-Akron, of which the new line is to be a practical extension. (May 10, p. 323.)

COLUMBUS & ARLINGTON.—This company has been incorporated by men identified with the Central of Georgia, with a capital stock of $500,000, to build from Columbus, Ga., via Lumpkin and Cuthbert to Arlington. The C. of G. has already made arrangements for the section from Cuthbert to Lumpkin. (July 5, p. 491.)

CONTINENTAL.—This company was incorporated in Iowa July 3, with a capital stock of $100,000, which may be largely increased, to build an air line 1,500 miles long from the Lake of the Woods in British North America, to the Gulf of Mexico, following along the ninety-fifth degree of longitude through the States of Iowa, Minnesota, Missouri, Kansas, Indian Territory and Texas. Wm. T. Smith, of Des Moines, Iowa, is the promoter of this very ambitious scheme.

DENVER & SALT LAKE RAILWAY, TUNNEL & MINING.—This company was incorporated in Colorado July 2,

with a capital stock of $5,000,000, to build a new short line connecting the cities named. The incorporators are: J. E. Ratchford, of Syracuse, N. Y., and John J. Reilly, D. W. Hannum, L. N. Cullis and David J. Kelly, of Denver.

Des Moines & Southern.—This company has been incorporated in Iowa, to build a railroad from Des Moines via Greenfield to Winterset. The incorporators are: B. F. Clayton, of Indianola, and F. W. Cherry, of Des Moines.

Dubuque, Vinton & Southwestern.—This company has been organized at Dubuque, Iowa, to build from that city through Vinton and Tama to Newton, Gasper County. The maximum grade is less than 1 per cent. The route is surveyed and contracts will be let as soon as possible. Major W. H. Day is President; D. D. Myers, Vice-President; F. W. Coates, Treasurer, and E. J. McVann, Secretary, all of Dubuque, Iowa. (Official.)

Erie, Bowling Green & Napoleon (Electric).—This company was incorporated in Ohio June 28, with a capital stock of $300,000, to build a line from Woodville via Pemberville, Bowling Green, Weston and Grand Rapids to Napoleon. The incorporators are: L. Black, R. A. Beatty, F. W. Rogers, W. M. Tuller, J. H. Whitehead, B. C. Harding, E. M. Fries, D. B. Whipple, A. Froney, R. S. Parker and M. B. Chidester, all of Bowling Green.

Fayetteville & Albemarle (Electric).—Arrangements are completed with the Connecticut Construction Co., of Danbury, Conn., to build this line from Fayetteville, N. C., west 33 miles to Southern Pines. Clark J. Brown, of Southern Pines, is President. (July 5, p. 491.)

Fountain-Warren Traction (Electric).—This company has been incorporated in Indiana, with a capital stock of $300,000, to build a line from Attica through Covington, Veedersburg and Williamsport. The incorporators are: Charles H. McCabe, Albert E. Harris, Morris Herzog and William H. Luke, Covington; Harry C. Martin, Attica.

Hawkinsville & Florida Southern.—A branch is projected from Davisville, Ga., via Fitzgerald to Ocilla.

Inverness & Richmond.—The company has completed its 56 miles of line between Port Hastings, N. S., and Broad Cove, and a further extension is to be made to connect at Point Tupper with the Intercolonial. (May 17, p. 342.)

Kansas City & Olathe Electric.—Part of the surveys are completed for this line to run from Kansas City, Mo., via Rosedale, South Park, Merriam, Shawnee, Lackman and Pleasant View to Olathe, Kan., 18 miles. Contracts will be let as soon as the road is financed. It will be a straight line with little grading. All the franchises and right of way have been obtained and some grading is done. F. C. Goodwin, No. 220 New York Life Building, Kansas City, Mo., is President. Henry W. Scott, of No. 6 Wall street, is the New York representative. (Official.)

Kaslo & Slocum.—A charter has been granted to officers of this company for a railroad from Crawford Bay, B. C., on the Kootenay Lake, to Fort Steele, 76 miles. Colonel N. W. Brayton, of Kaslo, B. C., announces that 12 miles will be built from the bay this fall.

Knoxville & Lower St. Clair Street (Electric).—This company was incorporated in Pennsylvania June 8, with a capital stock of $12,000, to build from Knoxville Borough to Lower St. Clair Township, and thence to Brownsville. The incorporators are: W. I. Berryman, President, Pittsburgh; C. F. Thompson, Charleroi; C. T. Marsh, F. M. Ross and L. G. Woods, Pittsburgh.

Laramie, Hahn's Peak & Pacific.—Grading is reported begun on this line from Laramie, Wyo., southwest 96 miles to the Colorado State line near Baggs. Isaac Van Horn, of Laramie, is President. (May 24, p. 357.)

Lehigh & New England.—Building is reported begun on an extension from Wind Gap, Pa., to Jacobsburg, and thence via Aluta and Chapmansville to the Lehigh River.

Surveys are reported in progress for a branch from the American-Bangor slate quarry at Bangor, Pa., via Mud Run, to the Pennsylvania Railroad.

Lima, Delphos, Van Wert & Fort Wayne Traction (Electric).—With reference to this line, an officer writes that the road is projected from Lima, Ohio, northwest via Delphos and Van Wert to Fort Wayne, Ind., almost an air line 61 miles long. Some heavy bridging will be required. No contracts will be let under 60 days. The principal office is at Lima, Ohio. Davis J. Cable and Wm. L. Parmenter, of the law firm of Cable & Parmenter, Masonic Building, Lima, Ohio, are interested. (June 28, p. 474.)

Magnetawan River.—The stockholders will meet at Burk's Falls, Ont., on July 24, to authorize the building of this line from near Burk's Falls, on the C. P. R., to run north about two miles to the Magnetawan River. J. S. Sharpe, of Burk's Falls, President.

Metropolitan Street (Electric, New York).—Contracts are let to Hart & Co. for building the connecting line from 166th street, north along the Kingsbridge Road to Kingsbridge, to connect with the South Broadway line from Yonkers, to be finished in about three months.

Mexican Roads.—The Government of Jalisco is reported to have granted a concession to Paula Gutierrez V. da Babadida for a railroad from Saynia to Cofradría, on the Mexican Southern.

Missouri, Kansas & Texas.—An officer writes that the company is now grading for a new yard in Greenville, Tex., which will require about five miles of track, but the yards will be arranged so that further extensions can be made if necessary. There will be built coaling chutes located on the main line at the end of the yard. Building will also involve certain rearrangement of the main track. (June 21, p. 448.)

Morris County Connecting.—This company was incorporated in New Jersey July 1, with a capital stock of $40,000, to build a railroad 1¾ miles long in Morris County. The incorporators are: Joseph Wharton, J. Bertram Lippincott and H. S. Morris, Philadelphia; Edward Kelly, William F. Smith, Dover; Augustus Munson, Rockaway, and Richard B. Moriarty, Morristown.

New Brunswick Coal & Railway.—Bids will shortly be asked, according to report, for building from Chipman, N. B., to Gibson, passing through the New Castle coal fields. The first section of 15 miles from Chipman to New Castle has been located, and will be let separately. E. G. Evans, of Hampton, N. B., has the plans. (May 24, p. 358.)

New Jersey & Staten Island Junction.—Building was begun last week on this proposed tunnel line from Sixty-fifth street, Brooklyn, under the Narrows, to Staten Island. The completed line is to run from the Kill von Kull bridge to Stapleton, and thence under the Narrows to Thirty-ninth street, Brooklyn. This is under the franchise of Erastus Wiman. Stephen Hoyle, 189 Montague street, Brooklyn, is President. (April 26, p. 292.)

New Orleans, Ansley & Birmingham.—This company has been organized to build from New Orleans, La., to some line reaching Birmingham, Ala. M. E. Ansley, of Ansley, Miss., is President, and C. D. Stewart, Secretary.

Norfolk & Western.—An officer writes that the company is building a branch six miles long from a point one mile from Grayson, Va., where the North Carolina division crosses New River, to extend up New River to the cotton mill of Colonel Fries and others. (June 21, p. 448.)

Surveys are reported completed for a branch from Chestnut Yard, Va., south to Blue Iron Ore in Ashe County, N. C.

Northern Indiana & Ohio Traction (Electric).—This company has been incorporated in Indiana, with a capital stock of $50,000, to build a line 10 miles long from Angola to the State line east of Steuben County. The directors are: Newton W. Gilbert, John F. Sherman, Sol A. Wood, William H. Walker and J. Edward Waugh.

Northwest Territory Roads.—Haultain, McKenzie & McNeil, solicitors of McLeod, N. W. T., have made application to the Parliament of Canada for an act to build from McLeod, District of Alberta, N. W. T., thence via Stand Off and Cardston south to the International boundary, with branches not exceeding 30 miles.

Ohio Central (Electric).—This company has been incorporated in Ohio, with a capital stock of $10,000, to build a line from Columbus through the counties of Franklin, Licking, Fairfield, Perry, Muskingum, Guernsey and Belmont to Bridgeport. The incorporators are: J. S. Sikes, C. A. Spenny, H. C. Werner, W. B. Cosgrove and W. E. Finch.

Olney, Lancaster & Mount Carmel.—This company has been incorporated in Illinois, with a capital stock of $50,000, to connect the cities named. The incorporators are: Robert Parkinson and M. H. Munday, Mount Carmel; J. C. Couch, Friendsville; Charles J. Seibert, Lancaster; J. J. Bunting, Berryville, and Aden Knopf and William Bower, Olney.

Oneonta, Cooperstown & Richfield Springs (Electric).—The New York State Railroad Commission has authorized this company to increase its capital stock from $750,000 to $1,000,000. The line is to run from Oneonta, N. Y., via Cooperstown to Richfield Springs, and it is hoped to have it completed this year. Dr. N. Getnan, of Richfield Springs, is President. (June 7, p. 390.)

Pan-American.—This company has been incorporated in New Jersey, with a capital stock of $1,000,000, to build railroads and canals in the United States and Mexico. The incorporators are: William C. Boyden, Thomas F. Jackson and John J. McDougall, of No. 110 Dearborn street, Chicago.

Portland, Vancouver & Yakima.—Contracts are to be let at once, according to report, for an extension of 18 miles from Daly Road, Wash., northeast. (Construction-Supplement, March 8, 1901.)

Quebec & James Bay.—This company, whose title has been changed to the Trans-Canadian, has begun work on the first 10 miles. The road is projected from Quebec, or some point on the Quebec & Lake St. John, to James Bay. Joseph Paquet, of Levis, Que., is the contractor. (Construction Supplement, March 8, 1901.)

Rumford Falls & Rangeley Lakes.—McGregor Bros., of Rumford Falls, Me., are reported to have the contract for the extension from Bemis, Me., north nine miles to Mountain View, and building is in progress. (June 28, p. 478.)

St. Louis Southwestern.—Surveys are reported in progress for an extension from Malden, Mo., to Memphis.

St. Louis Valley.—Grading is reported in progress on this line from East St. Louis, Ill., south 152 miles to Thebes. It is proposed to connect with the St. Louis Southwestern at Grays Point, Mo., with a bridge across the Mississippi. Wm. E. Guy, of St. Louis, is President. (April 5, p. 246.)

Saugerties & Palenville (Electric).—This company was incorporated in New York July 5, with a capital stock of $250,000, to build a line 16 miles long from the bank of the Hudson River near the village of Saugerties to the station of the Otis Elevating Railroad, north of Palenville. The incorporators are: Robert N. Jackson, Chas. E. Jackson, Middletown, Conn.; Eben Jackson, Deiderick G. Gale, New York City; Deiderick G. Gale, Jr., Martin Cartine, Saugerties, N. Y.; Theo. V. R. Brown, John W. Searing, Kingston, N. Y.; Lee J. Lockwood, New York City.

Scranton & Northeastern (Electric).—Grading is in progress on this line from Scranton, Pa., southwest through Moosic, Avoca and Pittston to Wilkesbarre. The contractors, beginning at the Scranton end, are M. H. Dale, to Scranton, three miles; Joseph Page & Co., to Moosic, two miles; John T. Dolan, Elizabeth, N. J., to Avoca, two miles; John T. Neville, Paterson, N. J., to the aqueduct crossing the Lehigh Valley; P. T. McGowan, Avoca to Pittston. Surveys are in progress between Pittston and Wilkesbarre, and later the road is to be extended from Scranton to Carbondale.

Southern Missouri & Arkansas, of Arkansas.—This company has been incorporated in Arkansas to build from Newport, Jackson County, north about 80 miles to the Missouri State line.

Southern Pacific.—Surveys are reported in progress for an extension from Cachise, Ariz., to Naco, to connect with the Cananea Consolidated Copper Company's line into Mexico.

An officer writes that the company is doing nothing toward the extension of this line from Klamathon, Cal., northeast to Klamath Falls, Ore. He believes that an independent company has been formed and is agitating the extension. (June 14, p. 422.)

Improvements amounting to many millions of dollars are to be made on this line, including new bridges, the elimination of curves, the reduction of grades, heavier rails, etc.

Tallulah Falls.—The directors have ratified the action of the stockholders to place a $600,000 mortgage on the Blue Ridge & Atlantic extension from Tallulah Falls, Ga., south 45 miles to Franklin, N. C. (B. R. & A., May 10, p. 323.)

Toledo & Michigan Terminal.—Building is reported begun under J. N. Bick at Toledo, Ohio, for this line, recently incorporated, from that city north about 25 miles to Monroe, Mich. The principal office is Detroit. Frederick W. B. Coleman, Detroit, is among the incorporators. (May 3, p. 308.)

Velasco, Brazos & Northern.—This company has been incorporated in Texas, as successor to the Velasco Terminal. The charter provides for several extensions. The directors are: I. H. Kempner, D. B. Henderson, John Sealy, Sealy Hutchins, Hy. Masterson and H. E. Masterson. (May 24, p. 358.)

Virginia & Southwestern.—The company is reported to have made a proposition to the citizens of Johnson County, Tenn., to extend its line from Vaughtsville to Mountain City, five miles, provided Jackson County will build a macadam road from Mountain City, eight miles, toward North Carolina, and furnish the right of way and necessary ties for the railroad. (April 12, p. 260.)

Wabash & Rochester (Electric).—This company was incorporated in Indiana June 27, with a capital stock of $50,000, to build a line 33 miles long to connect the cities named. The directors are: John B. Litchem, Aaron Simons, Richard P. Macy, James Lynn, Jr., Warren S. Sayre, Alvah Taylor, Lawrence L. Daugherty, Wilbur A. McNamee and Maurice S. Howe.

RAILROAD NEWS.

Cincinnati, Jackson & Mackinaw.—Notice is given by the Martin committee that a majority of certificates of interest in the hands of the public have united under the agreement of June 6, 1901. The court, according to the committee, has refused to grant relief to certificate holders who are not represented. Judge Wilmot M. Smith, in Brooklyn, on July 2, handed down a decision to the effect that the action of the Olcott reorganization committee in pledging the securities of the company was without authority and that the stockholders must receive the stock provided for under the reorganization plan or else the committee must be enjoined. Under the plan, the issue of preferred stock was to be made for the bonds, and a reduction in the capital stock from $16,300,000 to $3,260,000, but as the conditions were unfavorable, the plan was never carried out, and the reorganization committee pledged the deposited stock and bonds as collateral security for a loan of $1,000,000. Default was made on this loan and the securities were recently sold at auction. (June 14, p. 422.)

Cincinnati Southern.—The contract for the lease of this property to the Cincinnati, New Orleans & Texas Pacific was approved by the Cincinnati Southern trustees on June 29. This approval also included the issue of $2,500,000 bonds for terminals. The matter is yet to be accepted by the leasing company and to be acted upon by the voters of Cincinnati at the November election. (May 3, p. 308.)

Georgia, Florida & Alabama.—This company, recently changed from the Georgia Pine, has made a mortgage to the Manhattan Trust Co., New York, to secure an issue of $550,000 first mortgage 50-year 5 per cent. gold bonds, dated July 1. The proceeds are to be used for the proposed extensions.

Illinois Central.—The directors, on July 8, decided to recommend to the stockholders, for action at the annual meeting, Oct. 16, an increase in the capital stock by $13,200,000, and that each stockholder of record on Oct. 31, be permitted to subscribe at par for one share of new stock for each five shares owned.

Mineral Range.—This company has issued $1,000,000 new general mortgage 50-year 4 per cent. bonds, due 1951. The entire authorized amount of consolidated mortgage bonds, due 1931, amounting to $600,000, is also outstanding, of which $346,000 bears interest at 5 per cent. and the remainder at 4 per cent. The authorized capital stock is $800,000, of which $643,400 is outstanding.

Minneapolis & St. Louis.—Mr. Stuyvesant Fish, President of the Illinois Central, denies that his company is to take over the Minneapolis & St. Louis, as recently reported. (July 5, p. 492.)

Ohio Southern.—The time for depositing the second mortgage bonds and stock for participating in the new Detroit Southern Co., expired July 1. More than 90 per cent. of the securities were deposited.

Philadelphia & Reading.—The stockholders of the Atlantic City have authorized a consolidated mortgage to secure an issue of $4,500,000 4 per cent. gold bonds, of which $3,300,000 is reserved to retire Atlantic City bonds of 1889, and bonds of the Seacoast. (July 5, p. 492.)

Richmond, Fredericksburg & Potomac.—A company is to be organized to take over the property of this company and the Washington Southern which, together, extend from Washington, D. C., to Richmond, Va., 114 miles. The new company is to be equally owned by six companies, the Pennsylvania, the Baltimore & Ohio, the Atlantic Coast Line, the Southern, the Seaboard Air Line and the Chesapeake & Ohio. The capitalization of the new company will be sufficient to cover the present capitalization of the two companies.

St. Lawrence & Adirondack.—The stockholders have voted to accept an act of the Dominion of Canada for incorporation, and to issue $300,000 6 per cent. 50-year gold debenture bonds to take up car trust certificates.

St. Louis & San Francisco.—More than a majority of the underlying bonds were deposited under the refunding plan prior to July 1, and a considerable amount has been since deposited. (June 28, p. 474.)

St. Louis, Kansas City & Colorado.—The stockholders, on June 29, authorized an issue of $20,000,000 50-year 4 per cent. gold bonds to pay the sum due the Atchison, Topeka & Santa Fe, and to provide for building the extension from Bland, Mo., west toward Kansas City. (Construction column, June 14, p. 422.)

Savannah, Florida & Western.—Articles of incorporation were filed with the Georgia Secretary of State, July 8, to increase the capital stock to $25,000,000. This is preparatory to absorbing several other roads of the Plant System. (July 3, p. 492.)

Seaboard Air Line.—The company has called for redemption the $3,400,000 6 per cent. certificates, due March 26, 1902, to be paid, principal and interest, Aug. 28, at the office of the Continental Trust Co., trustee, Baltimore.

Texas Central.—The first dividend on the common stock being 2½ per cent., and also a semi-annual dividend of the same amount on the preferred stock has been declared, payable July 15.

Toledo & Monroe Electric.—This property has been taken over by the Detroit & Toledo Shore Line, both controlled by the Everett-Moore Syndicate, and both partially completed between Toledo & Detroit. (June 14, p. 422.)

Western Maryland.—An equipment trust has been made for $151,655 on 10 new locomotives, of which $14,000 was payable May 10, and the rest in 36 monthly installments of $3,824.